

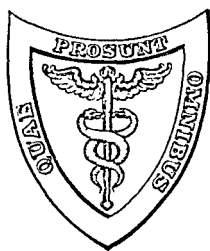
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EDWARD P. DAVIS, A.M., M.D.

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JANUARY, 1894.

REMARKS UPON APPENDICITIS, BASED UPON A PERSONAL
EXPERIENCE OF ONE HUNDRED AND
EIGHTY-ONE CASES.

BY MAURICE H. RICHARDSON, M.D.,
OF BOSTON.

THE subject of the treatment of appendicitis is by no means exhausted. Since my last report of eighty-seven cases, published in the *Boston Medical and Surgical Journal* of August 4, 1892, I have seen one hundred and two cases in which the question of operation for a probable appendicitis was raised. Of these, eight proved to be some other abdominal disease, as shown either by operation or by autopsy. In the remaining cases some affection of the vermiform appendix was undoubtedly present. This list does not include the cases I have seen with my colleagues at the Hospital. In my own there have been forty-three deaths. At least thirteen of these were moribund at the time of my first visit. In my private surgery the deaths from this disease have exceeded many fold those from all other causes combined. In the surgical wards of the Massachusetts General Hospital in the last four years there have been one hundred and thirty-six cases, exclusive of thirty-one of my own. The greater number of these in the practice of my colleagues I examined myself. In a total of one hundred and thirty-two operations there were one hundred recoveries and thirty-two deaths.

Even with this large experience I still feel in grave doubt as to the proper treatment of certain cases. Many of my colleagues with large experience have expressed misgivings as to many questions that have arisen from time to time, as new or unusual conditions have appeared.

The most positive assertions in connection with the treatment of appendicitis have been made, as a rule, by those with the most limited experience. In my first paper upon this subject, published in the *Boston Medical and Surgical Journal* of January 19, 1888, I drew five conclusions from the five cases I had seen up to that date. To one or two of these I still adhere; the others have been long since shown to be unsound. My present views upon this subject will undoubtedly change in time. Their only claim for attention rests upon the large experience from which they have been drawn.

This uncertainty which I feel in the management of the gravest forms of appendicitis; the large death-rate, not only in my practice but in that of my associates; the great prevalence of this disease, and the numerous cases that, unrecognized, are left to die unrelieved—these are my reasons for presenting a few remarks upon one of the most important questions which have arisen in the past few years.

There is a group of cases in which there can be, at the present time, little or no discussion as to the advisability of interference. I refer to the cases of localized peritonitis—where drainage is acknowledged to be the proper treatment by universal consent. But even in this procedure there has been, and is, a difference of opinion as to the advisability of separating the adhesions and removing the appendix.

In those mild cases where the constitutional and local symptoms are trivial, a great difference of opinion exists as to the wisdom of interference. In the severe types of inflammation, where there is a considerable extravasation, and where the constitutional and local signs are marked, there is little to be said at the present time against immediate surgical interference. But even in these cases the attending physician is not always familiar with those conditions in which a grave prognosis would be given by an experienced man. Cases have come to my notice—as will be seen by a glance at the tabulated cases—in which the favorable moment for operation has passed, and in which an operation has been performed in the presence of a general peritoneal infection. The group of symptoms by which we may recognize this impending danger is still to be accurately described. I do not mean to say that it ever is possible for a man who has seen but few of these cases to make his own diagnosis and prognosis from any written description—for it is only by long experience that one is able to give a probable prognosis in any case—but an analysis of a great number of cases, and continued discussion on this subject should enable the general practitioner to recognize at least those conditions in which the services of an expert should be sought.

I am firmly convinced that appendicitis is the most important acute abdominal disease of the present time, and that excluding certain zymotic diseases it is the cause of more deaths than any other acute

abdominal lesion. It has been said by some that deaths from peritonitis after operations for perforative appendicitis have been due to the operation itself. While I have no doubt that peritonitis has resulted and death has followed in cases which, if left to themselves, would have got well, still these instances are extremely rare. On the other hand, the number of deaths from this disease if left to itself has been and always will be deplorable. Moreover, the number of deaths from appendicitis is much greater than we suppose; for there is no doubt whatever that many deaths caused by appendicitis are ascribed to other lesions—especially to typhoid fever. Since May 1st I have known of at least twenty deaths from appendicitis in the practice of various men in this community. That the fatal result has not been due to the operation itself in all these instances is shown by the fact that in many of them no surgical interference whatever was made, while at every operation a general peritoneal infection has been found.

The number of deaths from appendicitis in which the true cause is not even suspected is, I have no doubt, very large. We have no accurate means of ascertaining the number of these deaths. If we take the returns, however, and select those cases where death has been caused, in males under forty, by "inflammation of the bowels," we shall get an approximate estimate of the number of deaths from this disease. "Inflammation of the bowels," I hardly need say, in males under the age of thirty or forty, is almost invariably caused by appendicitis. The statistics which I have gathered in my own practice in acute abdominal surgery show that in an enormous percentage of cases in males the cause lies in the vermiform appendix. Ten per cent. would be a large estimate for all other causes of peritonitis. In the city of Lowell, in the year 1892, Dr. Gage's examination of the returns shows twenty-seven deaths from "inflammation of the bowels" in young males. In the year 1880 there were in the city of Boston 40 deaths from inflammation of the bowels in males. In 1881, 41; in 1882, 40; in 1883, 43; in 1884, 54. In five years, therefore, in the city of Boston we have, presumably, deducting ten per cent. for other causes, 194 deaths from appendicitis in the years in which few operations were performed.

I need hardly emphasize better the importance of this subject than by calling attention to the great number of deaths from this disease—deaths most of which, I have no doubt, could have been averted even by our present imperfect methods of diagnosis and operation.

DIAGNOSIS.—The diagnosis of appendicitis has been considered easy, but in my experience it is at times impossible to discriminate between this disease and certain others, though the history, with the local signs, is sufficient to make a diagnosis in the majority of cases. With very rare exceptions, a diseased appendix is the cause of all peritonitis, local or general, occurring in males. In children who are not able to describe

their symptoms the condition may apparently be abdominal when really due to lesions in distant parts. Errors are more likely to arise where symptoms of intestinal obstruction are present early in the disease. In some instances the septic extravasation is so rapid that inhibition of peristalsis is one of the earliest symptoms. A general peritonitis, associated with obstipation, with distention and absence of physical signs, cannot be clearly distinguished from certain other forms of acute obstruction. The rarity of the latter conditions enables us to rule them out on the chances. The indications for interference, however, in all these lesions are clear, so that an early exploratory operation will be on the safe side.

On the other hand, when the symptoms point to any one of the rarer lesions—like intussusception, volvulus, or internal strangulation—the possibility of an appendicitis must always be borne in mind. Not infrequently I have found a gangrenous appendix in cases where a diagnosis of internal strangulation had been made by the most experienced men. In one case in particular, the pain and local signs were all situated between the umbilicus and the spleen. Nothing was found in this region at the operation but purple and distended coils of small intestine. Death took place in a few hours. At the autopsy, in the diagonally opposite quadrant the appendix was found perforated and gangrenous—the source of the whole trouble. In all cases of general peritoneal infection, in which the lesion is obscure, the possibility of an appendicitis must always be borne in mind.

The prominent symptoms of appendicitis, when occurring singly, may be due to other causes than a perforation of the appendix.

PAIN.—Sudden acute pain is common to all acute abdominal conditions, including hemorrhage. Pain associated with constitutional disturbances, rise of temperature and pulse—even if the site of the pain is remote from the appendix—is usually due to an affection of this organ. Pain considered alone very frequently has no direct relation with the usual anatomical seat of the appendix. In most of the cases where the diagnosis is beyond question, as shown either by autopsy or by operation, the initial pain is in the epigastrium, or is an indefinite pain “through the bowels,” “all over the bowels,” “in the lower part of the bowels,” “in the stomach,” or “in the bladder.” The explanation of this phenomenon lies probably in the close nerve relations throughout the abdominal cavity—in the intimate network of the sympathetic system. In making a diagnosis, therefore, the seat of the pain in the first hours of an appendicitis is of no great importance. As the case progresses, however, the pain usually becomes localized in whatever region the appendix may occupy; but even this statement has exceptions. At times the pain is referred to remote regions throughout the whole course of the affection. The character of the pain may range from a slight discomfort to an agony, in which

the patient writhes in the greatest distress. In long-continued cases the pain may subside and become an unimportant feature of the disease.

TENDERNESS.—Tenderness is a more important symptom for diagnosis than pain, inasmuch as this symptom is usually placed directly over the lesion. Even in a general peritonitis the tenderness is more marked over the appendix than anywhere else. Tenderness may be exquisite or it may be elicited only by deep pressure.

One must be on the lookout for error in estimating the importance of this symptom. In this respect the attending physician, who has had a long and intimate knowledge of the patient, is better able to judge than one who sees the case for the first time. Some patients make much of pain and of tenderness, while others make very little of it; a casual observer may be deceived where a constant attendant will not. In practice, however, it is seldom difficult to estimate with sufficient accuracy the value of this symptom.

VOMITING.—In almost all cases of appendicitis—whether of the mild or of the severe type—vomiting soon follows the onset of pain. If the other symptoms subside, or if the peritonitis becomes distinctly localized, vomiting soon subsides. In unfavorable cases, where the peritonitis soon becomes general, vomiting—at first of the normal contents of the stomach, later of bile, and finally of the contents of the small intestine—is a continuous symptom until death, which often takes place in the midst of an attack. If the vomitus is not distinctly stercoraceous in fulminating cases, it soon becomes of coffee-ground color. The existence of this symptom I look upon as a very serious matter. As a rule, when there is constant regurgitation of dark coffee-colored fluid, the prognosis is unfavorable. The septic nature of the vomitus must also be taken into account where anæsthesia is used, because in several cases a fatal septic pneumonia has followed, or a septic bronchitis has complicated an otherwise favorable course.

The material found in the peritoneal cavity is often, in general appearance, precisely like that vomited in advanced peritonitis—thin and dark in color.

DIARRHŒA.—A large number of cases are accompanied in the first hours of the attack by more or less diarrhœa. In some the diarrhœa precedes the attack. In the latter instances the inflammation of the appendix very probably starts in an extension of the catarrhal processes from the cæcum. In most cases, however, perforation takes place at the very outset, without any premonitory symptoms whatever.

TIME OF PERFORATION.—In many of the articles which have appeared in the last few years upon appendicitis, much attention has been paid to the time of perforation. We are advised to watch for symptoms of perforation, which is liable to occur on the fourth, fifth, or sixth days, or later. I must state here, most unequivocally, my conviction that in all

severe cases of appendicitis—and in fact in all cases where there is a localized peritonitis—there is a larger or smaller perforation, with extravasation. The first symptoms in severe cases of appendicitis depend upon a perforation, and not upon a catarrhal or an ulcerative process in the interior of the appendix. This fact is proved conclusively to my mind by the fact that in severe cases, marked by the onset of sudden acute pain, the appendix, when found, *has always been perforated*. In almost all cases the pain is caused by an extravasation of the intestinal contents. Vomiting is reflex, caused either by the pain or by the immediate absorption of the extravasated material by the peritoneum. Finally, in all severe cases of acute appendicitis, with localized or general peritonitis, seen immediately or within a few hours, I wish to repeat most emphatically my belief that perforation already exists, and that there is no question of waiting for perforation to take place on the third, fourth, fifth, or any other day.

CONSTITUTIONAL SYMPTOMS.—*The pulse.* The quality and the rate of the pulse give us, in appendicitis, valuable information as to the patient's condition and as to the prognosis. Observations of the pulse, however, throw little light on the diagnosis. It is early affected in serious cases, and may rise from 75 to 115 or 120. A pulse of 120 or more is considered by some surgeons an absolute indication for operating. In my experience a pulse of 120 in an adult is a grave symptom as to prognosis—depending, as it does, upon a serious constitutional infection. Its value, however, varies with the extent of the general peritoneal infection.

Temperature. The temperature in this, as in other forms of peritonitis, has very little weight with me, both as to diagnosis and as to prognosis. In some cases of general peritonitis, where the prognosis is absolutely hopeless, the temperature curve by itself is in every way satisfactory. I have known patients to die with a falling curve, and others to get well after an evening temperature of 104° to 105° for days. I have discarded, therefore, almost entirely the temperature as a guide to prognosis. It is an aid to diagnosis, however; but too much stress must not be laid upon this symptom.

Respiration. The respiration usually throws little light upon the condition of the patient. It is generally accelerated to correspond somewhat with the pulse and temperature. A very rapid respiration, however, is always a grave symptom, unless it depends upon simple mechanical distention. Caused by septic absorption its existence is of the gravest import. In a certain percentage of cases it is due to some complication in the lungs.

Distention. A general distention of the abdomen may be due to constipation from the use of opium, or to the formation of gas. Where there is no inhibition of peristalsis, this condition gives rise to discomfort

only. The abdomen should be auscultated for evidence of intestinal action; for even in some cases of the greatest distention there is no paralysis of peristalsis. Very often a general peritonitis can be ruled out by this method, the distention being merely mechanical. Where the distention is due to profound septic infection, no sounds whatever will be heard on auscultation; and there will be not only a stasis of the intestinal action, but at times a serious interference with intestinal circulation. The changes in the intestines caused by interference with the portal circulation are very marked early in the course of a general infection. They do not appear in a post-mortem examination, and therefore come under observation only in the course of surgical manipulations. These changes have the same cause as intestinal paralysis, and appear coincident with the latter. I have had unusual opportunities in recent years to observe this phenomenon, not only in its earliest manifestations, but also in its full development. Within the past two weeks I have seen, in a case of incipient general peritonitis, the jejunum distended, dark red to purple, with the portal radicles dilated and black. In another case (internal strangulation) the whole small intestine was similarly changed. Its coils were heavy, lifeless, distended, and cyanotic. The portal tributaries were beautifully injected, dark, and prominent. In the former case, to my great surprise, recovery followed, while in the second death took place in a few hours.

The existence of distention dependent upon a local infection is of the gravest import. At times the heavy coils can be felt through the abdominal walls. In all such cases the possibility of a portal thrombosis must be considered. Whether due to portal thrombosis or to local infection, with simple paralysis of peristalsis, no symptom is more important in the diagnosis and prognosis of this disease than a distended abdomen, accompanied by vomiting. Death almost always follows. Great care must be taken, therefore—as regards diagnosis, prognosis, and operation—to ascertain whether this distention is due to a septic infection, to a mechanical obstruction, or to simple constipation.

It is evident that the value of distention as a symptom depends upon its cause. In one or two abdominal cases I have been deceived, and have found, to my chagrin, that no serious condition, either of stasis or of mechanical obstruction, existed. Distention in connection with appendicitis, to be of any value from the diagnostic or prognostic standpoint, must be due to a general peritoneal infection. If due to any other cause its weight as an influencing symptom is almost entirely neutralized. For instance, I have observed time and again an uncomfortable distention after removal of the appendix in acute cases. Careful auscultation has shown the existence of peristalsis. At times the intestinal action has been strong enough to cause loud borborygmus. Such sounds are not only reassuring, but call for the exhibition of cathartics and the rectal

tube. Not that a general peritonitis may not be impending, for I have watched this symptom in doubtful cases, have noticed its gradual subsidence, and have seen develop the ominous signs of total intestinal inertia, and a complete inhibition of intestinal contraction, with an almost invariably fatal result.

RECTAL AND BLADDER SYMPTOMS.—Examination of the rectum should never be omitted. In those cases where the diseased appendix hangs over the brim of the pelvis we almost always get rectal tenderness. Moreover, the appendix, perforated and inflamed, in this position may give rise to frequent and painful micturition, to retention, or tenesmus. The absence of these symptoms, however, does not exclude appendicitis, for this organ may be situated in some of its unusual positions. In some cases pain in the bladder and frequent micturition have been almost the only symptoms.

LEUCOCYTOSIS.—In my hospital cases the past summer, examinations of the blood have been made in every case by Dr. Richard Cabot. With one exception there has been a marked leucocytosis in all cases of perforation. So invariably accurate has this symptom been as an index of inflammation that in my last case I postponed operation twenty-four hours on account of its absence. An extensive general infection was present, nevertheless, and death took place a few hours after draining.

ANATOMY.—I have very little to add to what has been written on the anatomy of the vermiform appendix. I have found it in the most unusual positions. The point of attachment to the cæcum is invariable—near the insertion of the small intestine, at the extremity of the well-marked line of longitudinal striations. In the greater number of cases the appendix lies at the brim of the pelvis, near the origin of the internal iliac artery. It may drop into the pelvis, or point to the left, or upward. It may be coiled upon the iliac fascia. More rarely it is placed behind the cæcum, with point upward or upward and outward. These variations depend upon the position of the tail of the organ, its base being fixed. At times, however, the cæcum itself is displaced, and with it there may be a very great variation from the usual position. For instance, I have found the cæcum and appendix in an omental hernia. I have seen the cæcum displaced upward, with the appendix on the liver. At times it is well over to the left.

Among the more unusual conditions I have twice seen the appendix in a pouch behind the cæcum, sheathed as it were in a pocket of peritoneum. Of all variations the commonest is the post-cæcal position, in which the appendix is practically extra-peritoneal. When my experience was very much more limited I looked upon this situation as one of great safety, on the ground that the natural obstacles to extravasation made the prognosis almost always favorable. I must now acknowledge this view to be erroneous. In many cases I have found

the appendix in this position, with an extensive gangrene of the post-cæcal tissues. Not infrequently the inflammation has broken through the natural boundaries and caused a general peritonitis. In severe cases the extravasations have followed up the colon and infected the surface of the liver, both inferior and superior, and in one instance have caused an empyema. The prognosis is, therefore, by no means necessarily favorable. Yet the obstacles to extravasation are greater than in the common positions. A perforation in such a position is marked by flank tenderness and dulness; the appendix usually presents itself, and can be more frequently removed without a general infection; moreover, walling off the peritoneal cavity when it must be opened is more feasible than in an appendix centrally located. The greatest evils have resulted from gangrene of the perinephritic tissues, extending under the liver and into the foramen of Winslow.

The question when to operate in appendicitis is the hardest one to decide.

CIRCUMSCRIBED PERITONITIS AND ABSCESS.—I think all will agree with me that cases of abscess should be opened and drained. Most surgeons believe that in cases of localized peritonitis no attempt should be made to separate the adhesions for the simple purpose of removing the appendix. I have no doubt whatever, from my own experience and from what I have seen of the work of my colleagues, that it is extremely dangerous to break down the barriers between an appendicular abscess and the rest of the peritoneal cavity. In some instances this must be done—drainage can be established in no other way.

A man with a limited experience in these cases may have had good luck every time he has found the general peritoneal cavity infected, and he may think the presence of septic fluids in the peritoneal cavity of little importance with proper cleansing and drainage. I have had at times case after case of recovery, even where there has been a total invasion of the peritoneal cavity. Then, under conditions precisely similar, where the infection has been no greater, where the patient's strength has been just as good, or even better, case after case has gone on to a general fatal peritonitis in spite of everything that I could do to prevent it. In these deplorable cases a fatal termination has taken place whether I have washed out with water or with an antiseptic solution, or whether I have confined my attempts to cleansing the peritoneal cavity by the use of dry gauze; whether salines have been used before the operation and after the operation, or both, or not at all; whether opium has been given or not; whether high rectal injections or low; whether gauze drainage alone, rubber drainage alone, or gauze and rubber drainage combined—whether any or all, or none, of these methods have been used, the same result has followed.

I am very much afraid of pus in the peritoneal cavity. It makes no

difference what the pus looks like, or where it comes from, its presence in the abdominal cavity is one of the gravest conditions that can possibly occur. In certain forms of inflammatory disease a rapid convalescence has followed, no matter how much soiling of the intestines there may have been. In other cases a septic instrument, a soiled finger, or a drop of such fluid as the uterine canal often contains is sufficient to start a fulminating and fatal peritonitis, and that in spite of all efforts to prevent such a result. In one of my cases I separated the firm adhesions about a perforated appendix, well shut off, and removed the appendix and omentum in a very rapid operation. There was very little shock. The patient died with a general infection in a very few hours. I have no doubt whatever that the method I used in this case was directly the cause of the fatal result, and I have never tried it since.

The objection to simple drainage, without the separation of adhesions, lies in the possible existence of other cavities. In certain forms of appendicitis I have observed pocket after pocket of pus in exploring the pelvis. These have been cases operated upon during the first three or four days—cases in which the symptoms have been grave from the outset, and in which there has been every reason to believe that there was a general infection. In cases where the adhesions are of a week or ten days' duration, I have generally found but one abscess cavity; I recall but two or three in which there was a second. If for no other reason, the low mortality in cases of circumscribed abscess, and the perfectly satisfactory permanent results that have followed simple incision and drainage, are sufficient grounds for limiting our operation to the cavity itself.

THE OPERATION IN LOCALIZED ABSCESES.—In a localized peritonitis of appendicular origin, where there is an adhesion to the abdominal wall, the incision should be made through the most prominent part of the tumor. This will often be found tympanitic. With rare exceptions, this resonance is due to gas mixed with the contents of the abscess. Now and then, however, we shall find that the abscess is post-cæcal, and that the bowel lies between the collection of pus and the abdominal wall. In the former case, having reached pus, the abscess cavity should be thoroughly drained by means of rubber tubing and gauze. If the cavity is very large and extends into the flank, flank drainage also should be used. In a large number of cases the abscess will be found behind the cæcum—the appendix being situated in that position—and a single flank opening will suffice. In some cases of localized peritonitis the abscess cavity is so situated that it cannot be drained except among the healthy intestines. This complication has always seemed to me *à priori* a dangerous one. That there is danger in this method of drainage is borne out by my experience. Where it is possible to evacuate such cavities through the rectum or through the

vagina, I certainly believe that this is the best method to use. The dangers are undoubtedly less by this method than by up-hill drainage through the unaffected peritoneal cavity. Nevertheless, drainage through the rectum and vagina is very unsatisfactory, and I should not resort to this method unless the abscess was pointing unmistakably downward. Last year I treated two cases by rectal puncture. In both a satisfactory recovery followed. In one, however, another attack made a second operation necessary. The appendix was removed by Dr. Beach by the abdominal route. In this case there was a most satisfactory termination, the second operation being performed in a mild attack with comparative safety. In the great majority of cases--the appendicular abscess being unattached to the anterior or lateral abdominal wall--the abdominal route must be selected. Every effort must be directed against contaminating the healthy intestines any more than is absolutely necessary. An incision over the tumor, as far toward the flank as possible, should be made, and it should be long enough for free exposure of the tumor. Before an opening is made into it by separating the adhesions with the finger, the cavity should be walled off in all directions with gauze. Where the opening is in the median line, a very effectual barrier can be made by disposing the gauze in the form of a well. After thoroughly evacuating and washing out, a double rubber tube should be placed in the bottom of the cavity and gauze should be packed about it. The gauze barriers which have been soiled in the process of evacuation should be removed and replaced by clean gauze. In the great majority of my cases--whether of this variety or not--when it has been necessary to use gauze, I have taken that sterilized simply by heat. Iodoform gauze I have used very sparingly, chiefly on account of the danger of absorption. The prognosis in these cases is grave, but the mortality is much less than in cases where there is already a general infection.

LOCALIZED PERITONITIS WITH PROBABLE GENERAL INFECTION.—It is an entirely different matter in the first few days of a severe attack, where there is reason to believe that there is a general peritonitis, or the beginning of one. When the peritoneal cavity is opened, and when it contains a serum, clear or turbid; when the peritoneum is injected, though there is no intestinal paralysis, all adhesions about the appendix should be separated, the intestines irrigated or wiped, and every dependent part thoroughly drained. The prognosis in such cases is very grave, for an appendicitis of this variety is always associated with a beginning general infection. The reason for this is that in almost all cases of extensive extravasation through a perforated appendix the micro-organisms have very great virulence, and the colonies that must remain, even after the most thorough cleansing, exert so powerful an influence that the peritoneum cannot always overcome it.

It is in the treatment of an acute severe form of appendicitis that we

can lay down a definite rule, if we can in any form. In this variety—marked by sudden pain, vomiting, more or less distention, and high pulse, with a localized tenderness—the appendix, as I have already stated, is always perforated; and through the perforation the contents of the intestine may be escaping with such rapidity into the peritoneal cavity that no efforts of Nature can restrain them. Such cases should be operated on at the earliest possible moment, the earlier the better, just as soon as the gravity of the situation is realized. We shall be disappointed, however, in our results, even where a rule of this kind is followed, not only because we shall not be called early enough, but because there are instances in which a fatal extravasation takes place, not in a few days, or even in a few hours, but in a few moments after the giving way of the appendicular wall. The mortality in such cases must be about the same as the mortality in a single perforation from a gunshot wound in a healthy intestine. Eliminating the dangers from hemorrhage, the chances are very similar. No one would seriously maintain that in perforating gunshot wounds of the intestine, without hemorrhage, a low rate of mortality prevails even where the surgical relief is attempted almost immediately. Where the extravasation goes on three or four hours we must expect, in gunshot wounds, a very high death-rate from peritonitis. The same conditions are present in certain forms of appendicitis. The opening is as large or even larger, and the fecal escape as great or greater. I have operated within six hours of the very first symptom of a perforative appendicitis. One of the earliest operations in my list was performed at nine o'clock in the evening, the first pain having occurred at three o'clock that afternoon. The peritoneal cavity was apparently completely invaded by a thin fluid of distinctly fecal odor. On delivering the appendix, gas and fecal matter escaped from it with a noise before the ligature was applied. This condition had probably existed for several hours. In this case, after careful cleansing of the peritoneal cavity with gauze and draining with rubber tube, general peritonitis rapidly developed, and the child died in the course of thirty-six hours. In another case, after a mild attack of two days' duration, in which there was undoubtedly a slight extravasation from the appendix, a gangrenous opening of large size in an appendix of considerable lumen suddenly developed at half-past ten. The abdominal cavity was opened at one, and was found full of serum, from which I obtained pure cultures of the *bacillus coli communis*. The appendix was removed with the greatest ease, but the harm had already been done. This robust young man died in twenty-seven hours with a general peritonitis. These two cases are the earliest operations in my experience—one in six hours and a second in three hours after a rapid extravasation. I am convinced, therefore, that we cannot, even in the earliest operations, have invariable success. I fully believe, however, that we shall save a large

number of cases which, under dilatory tactics, we should lose, by opening the abdomen in all cases of more than moderate severity in the first few hours or days of an attack.

I have often seen a patient for the first time in the third, fourth, or fifth day of an attack of severe type in which Nature had succeeded in opposing an adhesive barrier to further extravasation. Under these conditions the most important and difficult question arises—whether to operate or not. I have considered this question many times. It is during these days—the third, fourth, and fifth, or later—that the early operation may be said in some cases to be too late. The extravasation from the perforated appendix has taken place; the harm from this extravasation has been done; Nature, in her own way, has successfully, thus far, opposed this extravasation. The adhesions are not strong, and in separating them we are almost sure to contaminate the rest of the peritoneal cavity. It seems to me—though I am by no means convinced of the truth of this assertion—that there are instances in which we see the case too late for the early operation, and too early for a safe late operation; that if we operate we undo the work that has thus far been successfully accomplished by Nature, and that we convert a case that is doing well into a case of fatal general peritonitis. This is one of the most important questions in connection with the discussion of this disease. I do not mean to assert that interference in a localized peritonitis on the third, fourth, or fifth day is inadvisable. I have operated many times at this period. I have done so, however, with the greatest care not to break down the recent adhesions. There is no more difficult operation in surgery than that of removing an appendix at this stage without infecting the general peritoneal cavity. I do not mean to assert that, on the third, fourth, or fifth day, in a case that is getting on well, with a localized abscess, we should delay; but the reasons I have given must appeal to one who dreads the presence of infecting material in the peritoneal cavity. The objection to leaving to itself a case in which presumably the adhesions are not strong is the giving way of these barriers under pressure and a consequent fatal extravasation. That this danger is by no means slight is seen in the constant occurrence of a general peritonitis in cases that are apparently doing well. Where the symptoms of general peritoneal infection appear suddenly, in the course of a localized peritonitis, several hours at least must elapse before the surgeon can attempt to repair the mischief. Where the adhesions are broken down by the operation these efforts to cleanse the peritoneal cavity can, of course, be made at once.

RELAPSING OR RECURRING APPENDICITIS.—Where an appendix, unperforated, is removed in a period of health the mortality is very small. In my experience, which is limited in this class of cases, there has been no death. From the cases collected by Bull it would appear

that the mortality is perhaps two per cent. Taking all the cases together, however, I believe that we shall find the general mortality in the hands of all surgeons to be more than this. There are isolated and unreported cases—of which I am personally aware of one—in which death has taken place. Nevertheless, I believe that the operation should be advised and performed in all cases where, from frequent attacks, we are able to infer that there is chronic trouble. The operation in these cases should be performed by as short an incision in the right linea semilunaris as is adequate. Where the appendix is not adherent and the cæcum is movable, the operation may be performed through a very small incision. If there are many adhesions to be broken up, or if the appendix is not easily delivered, a longer incision must be made. In many cases a cuff of peritoneum can be made by a circular incision about the base of the appendix. This cuff should be turned back and the body of the appendix tied with silk. The cuff of peritoneum can then be turned forward and united in the Lembert method with fine silk sutures over the stump. I think it is a good plan to cauterize the base of the appendix before covering it in. The abdominal wound may then be united. In one case where the appendix was removed after recovery from an acute attack, I found a small collection of foul pus, by which the adjacent coils were presumably infected. In this case I left the wound open, with gauze drainage. A slow recovery followed. In similar cases I think it is always best to use drainage.

THE OPERATION IN ACUTE APPENDICITIS WITH A GENERAL INFECTION.—In these cases, as soon as the peritoneal cavity is opened, the turbid serum which it contains should be evacuated, as well as possible, by means of dry, sterile gauze. This should be done before search is made for the appendix. The incision in such cases should be made over the usual seat of the appendix, beginning near the pubes and extending upward and outward parallel with the fibres of the external oblique, and should be long enough to permit free exposure and manipulation of the parts. Having dried the pelvis and presenting intestines as well as possible with gauze, fresh pieces should be placed backward, upward, and toward the median line as a barrier against renewed infection. The appendix should now be sought. In a large proportion of cases considerable thin fecal fluid will be found, more or less confined to the immediate vicinity of the appendix. This should be removed by separating the adhesions about the appendix, irrigating and wiping, care being taken that the irrigating fluid shall escape from the wound without any impediment whatsoever. If the intestines get in the way and prevent the easy return of the fluid, we may be spreading in all directions fresh quantities of septic material and making matters worse than they were before. Having separated all the adhesions in the pelvis or wherever the appendix may be situated, pieces of dry gauze

should be packed into the dependent places and removed as soon as they become saturated. As soon as the parts are dry the appendix may be delivered and tied off. After a final cleansing and drying a double rubber drainage-tube should be placed at the most dependent portion of the cavity, and about this gauze should be lightly packed. Strands of gauze should also be placed upward toward the umbilicus and toward the right flank. In many instances it is of great advantage to make an opening in the right flank and to apply a gauze wick here also. A dry absorbent dressing should be placed over the whole. In a large proportion of cases, even where the general peritoneal cavity has become infected, this procedure will be followed by very satisfactory drainage, and the patient will recover. Unfortunately in many instances this effort will prove futile.

In some cases of general peritonitis the patient's condition is too bad for anything more than a simple incision with drainage. Search for the appendix cannot be made without adding so much to the shock that death may take place on the table. It is a question whether in cases of this kind operative interference is not to be condemned. The patient is on the verge of death, and the slightest manipulation will be surely fatal. The slight shock from anæsthesia even may be sufficient to produce death where no operation whatever is performed. The only chance for recovery in cases of this kind lies in leaving the patient to Nature. I have never seen a recovery under these circumstances, but I have known one patient to get well, though apparently moribund after operation for an incipient general infection. Statistics show that in very rare instances recovery may follow, even in advanced cases of general peritonitis.

In some instances death is clearly impending. I was once persuaded to operate on a moribund patient. The family were assured that the patient would die under ether. After a few breaths of ether he did die. I think it was a mistake to undertake an operation in this case, for surgical interference is unjustifiable in the face of certain death, even when it is insisted upon by the family.

TREATMENT OF DISTENTION.—One would infer from what is being said daily that nothing more is necessary in the obstipation of a general peritonitis than the free use of salines. In a general peritoneal infection, beyond the very earliest stage, medicinal treatment has no effect whatever. Salts, even if retained in the stomach by the most violent effort of will, produce no effect. Peristalsis, inhibited by septic influences, has an additional burden to overcome in excessive distention, for the power to contract may be neutralized completely by the latter condition. The question arises whether in desperate cases it is not advisable to incise the distended coil and let the accumulated gases escape. In one instance this procedure, practised by Dr. Warren, was followed by immediate

relief and ultimate recovery. It is quite likely that occasionally this method may turn the scale. The use of salines, in my experience, has been worse than useless under these conditions, for not only has there been no intestinal action, but the patient has been excessively weakened by vomiting or by violent efforts of will to retain the nauseating solutions.

THE USE OF SALINES IN APPENDICITIS.—In the mild form of appendicitis, the so-called catarrhal variety, in appendicular colics, and even in slight extravasations with localized peritonitis, salines or other cathartics may be given with safety in the majority of cases, not only in the early stages, but throughout the disease. Mild cases, however, do not require the use of cathartics; they do just as well under the opium treatment, or under no treatment at all. There is danger that occasionally a mild case may become a fulminating one. In the latter condition, and in all cases marked by sudden violent onset, salines or other cathartics should not be used under any circumstances whatsoever. I have no doubt whatever that the exhibition of salines will cause, in many such instances, renewed and fatal extravasations. Not only are the contents of the intestines liquefied by the use of saline cathartics, but intestinal contractions are stimulated, and if we have a considerable perforation in an appendix of large calibre, there is nothing whatever to prevent an extravasation extensive enough to infect the whole peritoneal cavity in a very few minutes. I have seen these extravasations taking place in the abdominal cavity time and again, and I have found not only the general peritoneal cavity everywhere invaded by thin fecal matter, but I have seen it pouring out of the perforated appendix. I therefore believe that cathartics should never be used in the beginning of an attack of appendicitis—that the use of opium is far more rational if anything must be used.

It is a different matter when the appendix has been removed after tying its base, or when, having drained a localized peritonitis, gauze barriers have been arranged against further extravasation; or when the disease has been going on long enough to make the adhesions strong. But not always in cases where presumably there are adhesions is it best to give cathartics until after the operation. Up to the first four or five days the adhesions which confine the septic material in a localized peritonitis are not strong, and increased pressure through the appendix caused by stimulated peristalsis may, and frequently does, rupture these adhesions and cause immediately a fatal peritonitis.

The theory of intestinal drainage seems to me a good one. I always feel encouraged when after abdominal operations the bowels begin to move freely; but in mild cases there is no danger from septic absorption, and therefore no occasion for catharsis. In general infections with an open appendix, no amount of intestinal drainage can get rid of the ex-

travasated material, and cathartics are worse than useless. In localized peritonitis there is no immediate danger from septic absorption, there is plenty of time for surgical drainage, and cathartics may rupture the recent adhesions. Finally, with the intestinal canal intact, free catharsis is very desirable, though certain salines cause exhausting vomiting and are often ineffectual.

PATHOLOGICAL CONSIDERATIONS.—In every case of localized abscess that I have seen there has been a very offensive odor to the pus. In many cases the abscess cavity contains gas, either intimately mixed with pus or in large bubbles. The odor may be fecal, or its quality may be that of simple decomposition. At times the odor has been very peculiar—difficult to describe, but extremely nauseating and offensive. The odor indicates an intestinal origin, or at least contamination.

In many of the cases that I have included under the heading *Appendicitis* there has been no absolute demonstration of the appendicular source. The diagnosis rests upon the facts, first, that in every case where I have been able to find the source of infection it has been in the vermiform appendix, with one possible exception; and, secondly, that even where I have not demonstrated a diseased appendix, I have found no other pathological explanation. In the exceptional instance referred to the tip of the appendix was gangrenous. Drs. Fitz and Councilman thought, however, that the infection of the appendix was secondary to the abscess, and that the abscess was the result of a pylephlebitis.

Some writers refer to a gangrene of the cæcum as complicating appendicitis in its acute stages. If such a condition exists, it seems to me very extraordinary that I have never observed it. I have often seen extensive gray deposits of lymph on the intestinal wall. These masses are always present in an appendicitis with perforation. But the intestinal wall under them is not affected so as to be weakened. In this deposit will be found great numbers of micro-organisms. The gross appearances in a localized peritonitis in its early stages are precisely like those of a general peritonitis as regards the deposits of lymph in more or less extensive gray patches. There is no reason why a necrosis of the intestinal wall should not take place; but so far as I have been able to observe, and so far as I have been able to learn, this gangrenous process very seldom occurs. In fact I have never seen perforations of the intestine with extravasation, from any other causes than gunshot wounds, stabs, ulcerations, strangulations, etc., except in those very rare instances where a large appendicular abscess has broken into the intestine. The question of resecting the intestine, therefore, for acute gangrene in the course of an acute appendicitis seems to me so remote that we need give it very little attention. It is, however, sometimes necessary to resect and suture the intestine in extensive fecal fistulæ resulting from a rupture of the abscess into the cæcum. Even in these cases it is much better to wait

until Nature has closed the opening as far as she is able. In one instance the whole contents of the intestines were evacuated for some weeks through the stump of a perforated appendix. There was some mechanical obstruction low down, probably from inflammatory pressure, and this spontaneous outlet undoubtedly saved the patient's life. I fully expected to be obliged to resect, but in two or three months the fistula closed entirely and the intestinal functions were perfectly re-established. In no instance has there been a permanent intestinal fistula after any of my operations. I have resected the cæcum once or twice for long-continuing fistulæ where the abscess had been left to take care of itself and had perforated the intestinal as well as the abdominal walls. In these operations the prognosis is very good indeed.

I have observed great variations in the diseased appendix itself. In all cases of perforation, the appendix throughout is swollen and hard. The mesentery of the appendix shares in the inflammatory infiltration. In many instances the mesentery is covered with the gray exudation alluded to above. In all, almost without exception, the mesentery is friable, and the ligature must be placed with great care so as not to cut through the vessels entirely. The appendix itself, though more friable than in a normal condition, is never so brittle as to be easily torn. In explorations with the finger, there is usually no difficulty whatever in recognizing the diseased appendix.

Unless there have been one or more previous attacks of localized peritonitis, the appendix, even in the second week of the disease, is bound to the surrounding parts by very easily separated adhesions. The strength of these adhesions, however, varies; and the experienced finger can tell with reasonable accuracy how much force it is safe to use in their separation. Yet in many instances it is impossible, even with the greatest care, to avoid infecting the general peritoneal cavity.

The appendix may become perforated at any point between the tip and the base. I have found the perforation quite as frequently at one point as at another. The perforation takes place, as a rule, where the concretion lies; and the concretion may be formed anywhere.

In my cases, almost without exception, there has been a fecal concretion in the appendix or in the abscess cavity. This body may be no larger than a grape-seed, or it may be as large as a small olive; it may be round or oblong, or more rarely, somewhat irregular. It is so soft that it may be crushed between the thumb and finger. The surface is generally smooth. It always lies directly under the perforation in a necrotic pocket. There may be more than one stone: in some instances I have found two or three. In such cases there is usually but one perforation. Where the appendix is not entirely removed the other stones may give rise to subsequent trouble, although this accident must be very rare. I have never found a grape or other large seed, but in

one instance the stone seemed to contain a large number of very minute seeds.

IMPORTANCE OF BACTERIOLOGICAL EXAMINATIONS.—Early in my experience of abdominal work I observed that certain cases did badly. It was hard to tell the reason for this. A fatal peritonitis would follow an operation in which I could recall no error in antiseptic technique. In all such cases the operation was a hysterectomy. In almost no clean operations did any such misfortunes occur. For instance, no deaths in clean ovariectomies have occurred in my practice since my first two operations in 1885. The only source of infection in cases of peritonitis following hysterectomy has been the uterine canal. In all these hysterectomies the extra-peritoneal method of treating the stump was used. In cases of appendicitis precisely alike, I have observed that one patient would get well and the other would die, acute general peritonitis always proving the cause of death. No bacteriological examinations have been made in my septic abdominal cases until this year. Of late, in as many cases as possible I have made cultures, at the time of the operation, of the abdominal fluids—of the clear or turbid serum, of the contents of the excised appendix, and of the pus of the appendicular abscess. The results already attained throw a great deal of light upon the cause of death in many instances. In most septic serous effusions into the peritoneal cavity, pure cultures of the *bacillus coli communis* have been found. This micro-organism, however, is not present in all cases. It has been found frequently enough in rapidly fatal peritonitis to justify the prediction of Dr. Roswell Park in regard to this organism, in his paper before the American Surgical Association last June. The presence of this bacillus will probably explain the rapidly fatal character of certain forms of appendicitis. I have found it also in one or two instances of localized peritonitis. I have failed to find it in a number of cases of circumscribed abscess of a few weeks' duration. The importance of a careful bacteriological examination in all cases of appendicitis cannot, in my opinion, be overestimated. This is true not only of the cases of perforation, but of those mild relapsing or recurring cases in which the walls of the appendix have not been perforated.

PROGNOSIS.—The prognosis in cases of appendicitis depends entirely upon the variety. In the mild cases, with one or two exceptions, recovery without operation has taken place. In none of them was an operation seriously considered. Not that an operation in these cases is unjustifiable, for one can bring forward many strong arguments in favor of surgical interference.

The prognosis in cases of localized peritonitis is almost invariably good. In my list recovery has followed in almost every instance. I may say that recovery has been invariable where the operation has been limited to simple evacuation, unless an incipient general peri-

tonitis existed at the time. Two or three deaths have taken place in cases where the prognosis seemed to be very favorable. But even in these cases the constitutional symptoms were severe, and although there were no symptoms of a general infection present at the time of the operation, I have no doubt that this condition had already begun. The prognosis where appendicular abscesses have been opened and drained is good. The recoveries have been permanent, with the exception of one case drained by the rectum, and another drained in the right iliac fossa. There have been renewed attacks in one in which Dr. Beach successfully removed the appendix; in the other there has been a second attack, and the man is now prepared for an excision during the interval. In the case drained by rectum the chances are that there was no closure of the wound by granulation from the bottom, as in healing by the abdominal route.

In cases of well-established general peritonitis, where there is a severe constitutional infection, where the intestines are paralyzed by the local poison, the prognosis is invariably hopeless. I have never seen—so far as I am now able to recall the facts—a recovery in any case of fully established general peritonitis, marked by obstipation, vomiting, and general septicæmia.

The case is quite different where we operate at the beginning of a general infection. Little could have been known of the appearances of the abdominal cavity at this stage of a general infection up to the agitation of this subject in the last few years, simply because operations were very rarely performed for any reason at this stage. The rule previous to the last few years was to wait, in all such cases, until the symptoms became so grave that the most conservative were willing to admit the necessity of interference. In the first stages of a general peritoneal infection from perforation of the appendix, there is little change in the gross appearance of the peritoneum. It may not even be injected. The intestines will be found bathed in a serous effusion in the very earliest stage—the effusion becoming turbid in a few hours. There may not even be an odor to this serous effusion. In the course of a few hours this thin fluid becomes more and more turbid, though it is always thin. If the patient lives long enough, it will become decidedly purulent in general appearance; the peritoneum in a very short time will become injected, and the characteristic appearances so common at post-mortem examinations develop. Cultures taken from the fluid in the first hours of a general infection grow rapidly and contain different forms of micro-organisms. In the most virulent cases which I have seen, where I have been able to take cultures, the *bacillus coli communis* plays the most important rôle. In several instances, nothing has been obtained but pure cultures of this germ. Whether the prognosis is invariably bad in the presence of the colon bacillus cannot as yet be said. There have

been no recoveries in the few cases in which I have obtained this culture from a fluid that has invaded the whole peritoneal cavity. In a localized peritonitis several cases have recovered in which this micro-organism was cultivated with several forms of pyogenic staphylococci.

I have had many recoveries where there has been a beginning general infection, but it is impossible to give a definite prognosis from the gross appearances, or from any information that we can obtain with our present knowledge of the subject. In two cases, apparently exactly alike, death will follow in the one and recovery in the other.

The prognosis in operations for the removal of the appendix in the interval, with or without adhesions, is very good indeed. I do not believe that the mortality will exceed five per cent., and probably it will be less than that.

PROGNOSIS AFFECTED BY PREVIOUS SEVERE ATTACKS.—Where there has been a serious attack of appendicitis, with an extensive localized peritonitis, or in those rare cases where recovery has followed a general peritonitis, a subsequent sudden perforation has been followed in several instances by the most rapidly fatal result. I have been interested in trying to account for this fact. In my early experience with appendicitis it seemed to me that an attack of extensive localized peritonitis would be an effectual barrier against a second extravasation. While this may be true in many cases, yet not infrequently I have observed that a previous inflammation has so changed the character of the peritoneum that it has lost its power of rapid adhesion-formation; hence, when a second attack by necrosis has broken through the appendix and its pathological barriers, the peritoneum shows no power whatever of restraining the extravasation. In such cases the peritonitis has been fulminating and most rapidly fatal.

AFTER-EFFECTS OF APPENDICITIS.—It is as yet too soon to ascertain the number of cases of relapsing or recurring appendicitis where I have advised no operation. The number that has come under my observation is very small. After excision of the appendix itself there has been no subsequent trouble whatever. In the cases of circumscribed abscess treated by drainage, without removal of the appendix, there has been subsequent trouble in not more than two instances. All fecal fistulæ, of which there have been many cases, have ultimately healed. The most unpleasant symptom in those cases treated by drainage has been a ventral hernia. In my early experience I supposed that the extensive adhesions formed among the intestines near the wound, with the closure of the cavity by granulations, would make a scar that could never result in hernia; but I have found that the scar tissue early becomes relaxed, and that an eventual giving way is by no means uncommon. Unfortunately there is no means of preventing this occurrence, and a subsequent operation is necessary.

STATISTICS.—In the following statistics I have considered all my cases in which the question of appendicitis has been raised. I have not included those I have seen in consultation with my colleagues. The first ninety-three have been published in more or less detail in the *Boston Medical and Surgical Journal*.

In many of the mild cases the diagnosis seemed sufficiently clear. Though some of them possibly were not appendicitis, the symptoms were sufficiently suggestive of that disease to raise the question of surgical interference. The most significant column is that containing the fatal cases in which no attempt could be made to save the patient. This list would have been much longer had I refused to interfere where death followed an operation performed as a forlorn hope. I have added the results in eight cases supposed to be appendicitis, but where some other acute lesion was found.

Of 181 cases, 130 were males and 51 females. The ages were:

MALES.				FEMALES.			
Between the ages of—				Between the ages of—			
1 to 10	.	.	6	1 to 10	.	.	6
10 " 20	.	.	39	10 " 20	.	.	10
20 " 30	.	.	38	20 " 30	.	.	7
30 " 40	.	.	19	30 " 40	.	.	11
40 " 50	.	.	10	40 " 50	.	.	5
50 " 60	.	.	10	50 " 60	.	.	5
60 " 70	.	.	1	70 " 80	.	.	2
Age not given	.	.	7	Age not given	.	.	5
<hr/>				<hr/>			
130				51			

In 181 cases there has been a history of previous attacks in 46—one attack in 22 cases, two attacks in 5, three or more attacks in 19, and the number of attacks not given in 12 cases.

The number of operations followed by death in which the general peritoneal cavity was found infected at the time of operation was 24. In 1 case death followed from general peritonitis where a circumscribed abscess was carefully opened and drained, with no apparent general infection. Once death followed from general peritonitis after separating the firm adhesions of a circumscribed abscess. In 2 cases the patient died, some weeks after a successful drainage, with general peritoneal infection from a second abscess. In 3 a fatal general peritonitis followed drainage among the healthy intestines. In 1 of these the abscess probably resulted from pylephlebitis, though the appendix was gangrenous.

In acute cases with operation and recovery there was a general peritoneal infection in nine cases; in drainage of abscesses the general cavity was infected more or less in 10; in 39 cases the general cavity of the abdomen was not opened.

In the whole number of 181 cases there were 43 deaths—a mortality of 24.3 per cent. In 107 operations there were 30 deaths—a mortality

of 28 per cent. The number of operations where there was a general peritoneal infection more or less fully developed was 32; the number of recoveries was 9—a mortality of 75 per cent.

In practically all the fatal cases general peritonitis was the cause of death. The severity of the cases is well shown by the fact that death followed in most instances in a few hours. Life was rarely prolonged over forty-eight hours.

With one or two exceptions, the operation was performed immediately. Where I advised delay I was obliged to operate subsequently in two or three instances. In but one of these cases was death due to this delay; in the others a fatal general peritonitis was caused by the unavoidable infection of the general peritoneal cavity at the time of the operation. This infection would have taken place just the same at an earlier date, for both were circumscribed abscesses so situated that extra-peritoneal drainage was impossible.

In addition to the 181 cases of appendicitis, I have been called to eight patients in which it seemed probable that there was an appendicitis. In 2 there was an acute obstruction from a band; in 2 malignant disease was found; in a fifth there was general peritonitis from gonorrhoeal infection; 2 were acute obstructions from omphalo-mesenteric bands; in 1, operated upon by a colleague, the appendix was unaffected. Of the 8, 2 recovered—the unaffected appendix and 1 case of omphalo-mesenteric bands. Temporary recovery took place in 1 of the malignant cases. The others all died.

SUMMARY.

	Recovered.	Died.	Total.
Chronic cases, operation	15	...	15
“ “ no operation	8	1	9
Acute cases, no operation	50	12	62
“ “ operation	58	30	88
Recurrent cases, operation	4	...	4
“ “ no operation	2	...	2
Appendicitis operated upon for acute obstruction ...		1	1
	<hr/> 137	<hr/> 44	<hr/> 181
Acute abdominal lesions mistaken for appendicitis 3	3	5	8
	<hr/> 140	<hr/> 49	<hr/> 189

ON THE NEUROSIS FOLLOWING ENTERIC FEVER KNOWN AS “THE TYPHOID SPINE.”

BY WILLIAM OSLER, M.D.,

PROFESSOR OF MEDICINE, JOHNS HOPKINS UNIVERSITY, BALTIMORE.

IN 1889 Dr. Gibney, of New York, described at the American Orthopædic Association a sequela of enteric fever which he called “the typhoid spine,” and which he regarded as a perispondylitis—“meaning an acute inflammation of the periosteum and the fibrous structures

which hold the spinal column together." He stated that his reason for the use of the word was "the production of acute pain on the slightest movement, whether lateral or forward, and the absence of any marked febrile disturbance or neuralgia." He described four cases.

In the first, a lad of fifteen years, toward the end of convalescence, complained of severe pain in the back, particularly in the lumbar region and especially after any movement. There was no disease of the bone; no pain in the distribution of the sciatic or anterior crural nerve. He was seen in the autumn of 1882 with Dr. Beverley Robinson. A spinal brace afforded relief, and in the course of two or three weeks he was practically well, but the brace was worn for more than a year.

The second case, a young man of twenty-four years, had an attack of typhoid fever, which ran a normal course. After convalescence was well established he complained of pain in the back, but he was able to be up and about, and played tennis. After a fall at tennis the pain became very severe, and he suffered so excruciatingly that he could only rest in a recumbent posture. Deep pressure over the iliac region on the left side and lateral or antero-posterior motion of the spine caused excessive pain. He had some fever. The symptoms persisted from the latter part of November until the beginning of January, but it was not until March that he was able to get about.

The third case, a lad of eighteen years, had typhoid fever in November, was convalescent by December 27th, and went to New York. On January 10th he fell while skating and struck his left hip. A week after this he had pain in the region of the lumbar spine. The stiffness became more marked and the pains increased in severity. On the 10th of February he went to bed and was seen by a surgeon in Albany, who regarded the case as one of psoas abscess. There was no fever, no evidence of disease of the spine, but the patient could not move without exquisite pain. He did not recover until May.

The fourth case seems to me to belong to an entirely different category, as it was an instance in which during typhoid fever a boy had kept both limbs flexed on the abdomen, and in convalescence was unable to straighten them—an event met with in many protracted illnesses in which the patient lies curled up in bed with the legs flexed.

In 1890, in a discussion at the Association of American Physicians following the reading of a paper "On Some Points in the Natural History of Enteric Fever," by Dr. James E. Reeves,¹ Dr. Loomis, Sr., referred to Dr. Gibney's observations and to one of the cases he had asked Dr. Gibney to see. Dr. Loomis knew of no reference in literature to a similar condition. Dr. Jacobi at the same meeting, besides protesting against the introduction of a new name, such as "typhoid spine," suggested that, in the absence of temperature, it might be one of two things, either a neurosis or a spondylitis, remarking that mild forms of spondylitis are not so uncommon as they are believed to be.

¹ Transactions of the Association of American Physicians, vol. v., 1890.

In the *American Text-book of Medicine* (page 90) Dr. Pepper remarks in the article on Typhoid Fever that he has observed in a series of cases "obstinate periostitis of the sternum or of the crests of the ilia, or in two instances, judging from the location of the pain and from the effect of movement of the trunk, of the front of the spinal column." Eskridge has also described a case.

I have not been able to find any other references in text-books or monographs on typhoid fever, either in English, French, or German. My attention had not been called to the condition until recently, unless perhaps a case which I saw several years ago with Dr. Grasett in Toronto was an illustration—a young officer, invalided from India after a prolonged fever, who had for many months attacks of the most severe pain in the back on the slightest movement, which incapacitated him completely; though when seen by me he looked strong and robust and had a good appetite. He subsequently got quite well.

The two following cases are, I think, illustrative of the condition which Dr. Gibney has described:

CASE I.—O. T., aged twenty-five years (hospital, No. 8201), admitted, complaining of pains in the back, hips, and stomach. The family history is good. His father and mother are living and well. One brother died of typhoid fever.

Patient was strong and well until July, 1892, when he had a very severe attack of typhoid fever with relapse. He was in bed for nearly three months; very slow convalescence. He remained well for three weeks; then the present illness began with pains in the back and hips, usually of a shooting character, and paroxysms of pain in the abdomen, of which he would sometimes have several in the day. He had to take again to his bed, and was there for seven weeks, having much pain in the lower part of the back and down the front of the legs. He never, apparently, from his account, had any paralysis. About June of this year he was well enough to go out and do light work about the farm. In the latter part of June he had another attack of severe pain in the back and abdomen. He had not to go to bed. There was much aching pain and shooting in the right leg from the hip down to the knee. In the latter part of July and in August he had severe attacks of diarrhœa. Since August he has been up and about, but not working, and has been able to go out shooting. At present he has slight pains at times in the back and in the legs, and yesterday there was an aching pain from the left knee to the ankle. The appetite is good. He never vomits, though he often has eructations. Bowels are costive. He sometimes has dyspnœa on exertion.

Present condition. Healthy-looking, well-nourished man, with fairly well developed muscles. He gives one the impression of a neurasthenic patient. Lips and mucous membrane of good color; tongue clean and moist; pupils equal; pulse, seventy to eighty; no increase in tension. Practically the examination of the thoracic and abdominal organs was negative. The abdomen was soft and nowhere tender. The chief complaint is of weakness in the back, and it hurts him to turn in bed. He describes the pain which he had last year as beginning in the small of

the back, passing round the hip-bones, and then up the back. Judging from the scarring of counter-irritation, the chief trouble was thought to be in the lower part of the spine. There is still a little tenderness on pressure just above the left sacro-iliac crest. Patient gets out of bed readily and stands well; walks with a natural gait; does not sway with the eyes shut. After prolonged standing or walking he complains of great increase of pain in the back. The knee-jerks are present, a little exaggerated; there is no ankle-clonus. The most careful examination of the spine fails to reveal any signs of organic disease. The urine is normal.

The patient remained in hospital a little more than a week, took large doses of *nux vomica*, and was encouraged to believe that he had no serious organic disease. Subsequent examinations gave no additional information, but the patient evidently was highly neurasthenic.

CASE II.—A. A., aged twenty-one years, architect's assistant. Seen with Dr. King May 10, 1893. Patient has always been a healthy man, and has never had any very serious illness. He is not of a robust constitution and, though bright, not of a very strong mental fibre. There are no special nervous troubles in the family.

In November and December last patient had typhoid fever, an attack of moderate severity. On New Year's day he sat up for the first time, and convalescence was gradually established. There were no sequelæ, no complications, and early in February he went to his work. He gained in weight and looked very well. He remained at work about three weeks, complaining only at times of pain in the back and of being very tired after sitting for a long time. One day he was very much jarred in the back by a sudden jerking of the cable-car in which he was riding. Early in March, after complaining very much of his back and of the pain on moving, and of tired feelings, he took to his bed, where he has remained ever since. Dr. King tells me that the chief symptom has been pain on movement. His general health has been excellent. The appetite has been good, he has gained in weight, and he has slept well. He has been nervous and at times almost hysterical. When quiet and at rest and not attempting any movement he does not complain of pain; but on turning, or on attempting to get out of bed, or even the thought of moving the legs is enough to cause him to cry out. The pains have been in the lower part of the back, extending sometimes up the spine and down the back and sides, more rarely the front of the leg as far as the knee. He has no fever, no chills, but has sweated a good deal. He has had no swelling of the joints.

Present condition. Patient is a well-grown young man, well nourished, musculature of moderate development. The palms of the hands are moist and sweating, and he was somewhat excited, and at our entrance flushed over the cheeks and neck and upper part of the chest. Face does not indicate any special strength of character; rather the reverse. Pupils of medium size, equal, active; tongue clean. Patient was in the dorsal decubitus, his usual attitude. On pulling down the bedclothes he implored us not to touch him, as he was sure it would hurt him very much. The abdomen was full and natural-looking. On palpation he complained of a good deal of pain in the left iliac region; but on withdrawing his attention and pressing forcibly with the left hand in the region of the heart, and asking whether he had pain here, the right hand at the same time could be pressed deeply into the iliac

fossa without causing any disturbance. The deepest pressure in the lumbar and iliac regions failed to reveal any glandular enlargements or thickening. The inguinal glands were enlarged; no special sensitiveness along the anterior crural nerves. On asking him to lift the leg he said it was impossible, as it hurt him so much; but in a few moments, placing the hand beneath it, he lifted it apparently without pain. When lifted in a semi-flexed position he said it was impossible for him to straighten it; but in a few moments it could be readily straightened, and he straightened it easily on the bed. There was no special wasting of the legs. He could move all the muscles freely, and was able to get up and stand on his legs if he took time. The sensation was perfect; the knee-jerks present, perhaps a little exaggerated; no ankle-clonus. The feet and ankles were perspiring freely. No swelling of the articulations and no pain on pressure of the muscles or in the popliteal spaces.

On asking him to turn over on his left side he demurred very much, but gradually, and apparently with a great deal of difficulty, he got himself over. The legs could then be moved easily and freely; no pain about the hip-joints, and the legs could be flexed and extended readily. The spine was straight; the lower dorsal vertebræ a little prominent. No tenderness at any point along the spinal column. On both sides in the lower lumbar and sacral regions he was sensitive at a distance of an inch and a half or two inches from the middle line, and particularly toward the sacro-iliac synchondroses and along the posterior third of the crests of the ilia. He stated that these were really the points of greatest pain. On any attempt at twisting, the spinal column was very sensitive, and we could not induce him to sit up. In the attempts to make this movement he seemed to suffer a great deal of pain and began to cry.

There were no sensory changes, no hemianæsthesia, no hemianopsia. The patient said that his chief trouble was more the dread of moving, lest it should cause pain, than any pain itself. Four days ago he sat up for a couple of hours—got out of bed himself and sat on the chair—but felt very tired, and the back was painful. Practically the examination in this case revealed neither Pott's disease nor neuritis.

He was ordered massage and electricity and the Paquelin cautery to the back, given strychnine internally, and urged to sit up a definite time each day.

June 10th. A few days after I saw him he was able to sit up, and improved rapidly. Went out on the 30th of May and has been doing remarkably well ever since. Called to-day; looks in very good condition. No pain in the back; feels a little stiff; knee-jerks are normal; condition good.

Cases II. and III. in Dr. Gibney's paper are very much like the ones here mentioned, particularly in the fact that the symptoms developed after convalescence, and in both instances there was a slight trauma—in one a fall while playing tennis and in another a slight fall on the left hip while skating. In the case reported here the patient also lays a great deal of stress on the jar which he received by the sudden jerking of the cable-car. In both the prominent symptom was pain on movement, and there was an absence of all signs of organic disease.

An explanation of the symptoms in these cases is by no means easy. As already mentioned, Dr. Gibney regards the lesion as a perispondylitis, an acute inflammation of the periosteum and fibrous structures holding the spinal column together; and with this view, judging from the quotation made, Dr. Pepper seems to agree.

Joint and periosteal troubles are by no means rare sequences of typhoid fever, but the symptoms do not usually develop (as in three or four of the cases here described) at so long a time after convalescence has been well established. The periostitis, seen oftenest about the sternum and the ribs, proceeds, as a rule, but not necessarily, to suppuration. I have on several instances seen a periosteal swelling disappear without suppuration. We do not have, so far as I know, protracted periosteal thickening, lasting for weeks or months, without suppuration; and it is difficult to conceive of the attacks of pain, such as are described in the second and third cases of Dr. Gibney's and in the second case which I here report, lasting for months, due to a simple perispondylitis, which in none of the cases passed on to suppuration. The general impression given by the patients whom I saw was that they were neurasthenic, and while, of course, it would be very illogical to assume that all of the instances are due to the same cause, yet I cannot help feeling that many of them are examples simply of a painful neurosis, an exaggerated condition of what was formerly known as "spinal irritation," and analogous to the condition of "hysterical spine" and "railway spine," in which the patients suffer on the slightest movement of the back or of the legs. In the second case reported the whole behavior during the examination was that of an hysterical patient; thus, he could not think of lifting a leg—even the idea was enough to give him agonizing pain—and yet in a few minutes he lifted it himself as he got out of bed. So also the slightest pressure in the lumbar or iliac regions would cause him to scream out; but while his attention was diverted pressure could be made with the greatest facility. The rapid recovery in a few days, with disappearance of all the symptoms, is quite inconsistent with any chronic perispondylitis.

I have recently seen a case presenting somewhat different features, but which I think may also be reasonably classed as a post-typhoid neurosis:

CASE III.—A. B., aged about thirty years, of New York City, consulted me October 2, 1893, stating that he had had trouble with his spinal cord. Family history was good; parents living; one sister, however, was insane.

He was nervous as a boy; used to tremble very much when excited, and had what he speaks of as nervous fits. He had gonorrhœa three or four times; never had lues; acknowledges excesses in *venere*. Takes alcohol, but is not a hard drinker.

September 23, 1891, he had an attack of typhoid fever of unusual severity, prolonged delirium, extensive bedsores, and very great prostra-

tion. Convalescence was not established until January 10, 1892. During and after convalescence he was very nervous and had had uneasy pains in the legs; his feet were tender, and he tired very easily. He had no pains in the back, no soreness; but the tenderness in the feet and nervous feelings persisted for six or eight months after convalescence, and he does not think that they have ever entirely disappeared. He attended, however, to his business, gained in weight, and felt pretty well, though never entirely free from uneasy sensations in the feet and legs. In the spring of this year these symptoms increased, particularly after some sprees. He had neuralgic pains in the legs and felt weak and unstrung, and evidently got into a very nervous condition. He had a dread of walking, and could scarcely force himself to go as far as the corner of the street. He slept badly and got into a state of extreme neurasthenia. There were twitchings of the muscles, the feet and hands felt numb, and he complained that when his shoes and stockings were off there was a smooth feeling, as if something was between the feet and the floor. At this time a doctor in New York suggested that there was some oncoming spinal trouble, and stated that in testing the sensation down the spine with hot and cold water he could not distinguish between them. He ordered him electricity and massage and general tonics, and for the past seven or eight weeks he has not been at work and has improved a good deal.

Present condition. Tall, able-bodied man; looks a little pale; gait is normal, not spastic; station good; no Romberg symptom; no atrophy of muscles; legs scarcely in proportion, however, to the rest of the muscular development. The spine is straight; nowhere painful on pressure; no special prominence of any vertebra. Sensation is everywhere good; no retardation; distinguishes easily between heat and cold. He thinks that about the feet and ankles the sensation is a little blurred and unnatural. He feels, however, a sharp point and distinguishes readily different objects, and the thermic and painful sensations are unaffected. He has no abnormal sensations about the back and abdomen, and has not any sense of constriction or girdle pains. There is no vasomotor disturbance. He sweats, however, easily and the hands are clammy, and he has had at times, he states, marked blueness and congestion of the feet, and they are often cold in the morning.

The reflexes are increased, knee-jerks active, particularly on the left side, and a slight ankle-clonus can be obtained. The skin reflexes are normal. There is no disturbance of the special senses. The pupils are a little large, equal, and react to light. The optic disks are normal; there is no restriction of the visual fields.

The examination of the thoracic and abdominal organs is negative.

Here, after a protracted and severe attack of typhoid fever with delirium and severe nervous symptoms and tardy convalescence, the patient had disturbed sensations in the feet and legs, aggravated shortly after, but diminishing somewhat within five or six months, never entirely disappearing, and recurring with some intensity during the period characterized by pronounced neurotic manifestations. Unlike the cases before described, there were no pains in the back and abdomen, only a sensation of weakness. The symptoms suggest (1) central (spinal)

lesion, (2) neuritis, or (3) a neurosis. From his statements it was evident that the doctor in attendance feared a central affection; but the patient's condition two years from the date of the fever would speak very strongly against any such view; nor does the case conform in its clinical history to a neuritis. The man insists that the feelings which he has now in the feet were also present during the convalescence and some months subsequently. There did not appear to have been any very special muscular weakness, such as sometimes develops after an attack of typhoid fever without any evidence of peripheral neuritis. In the paper by Dr. George Ross, "On Paralysis after Typhoid Fever,"¹ he refers to those cases in the following words: "It is not unusual after typhoid fever of considerable severity to find a definitely enfeebled condition of the lower extremities persisting for some time, and sometimes a person never entirely recovers his capacity for walking long distances. Such parietic cases have never been specially studied, but it is probable they would if any should fall under the head of defective innervation from prolonged exhaustion of the nervous centres." On the other hand, in the case under discussion the history and the general appearance of the patient suggest a neurosis following typhoid fever. The paræsthesiæ such as described are not uncommon symptoms of neurasthenia, in which also exaggerated reflexes are not at all infrequent.

It is not unlikely that under the designation of "typhoid spine" Dr. Gibney has described several distinct affections, and I would not be understood as holding that there may not be a perispondylitis. Nor are all of the painful backs following typhoid fever neurotic. Thus:

A patient recently under my care (hospital, No. 8049) was admitted in an attack of moderate severity about the end of the third week, the temperature falling to normal by the twenty-sixth day; then after a period of apyrexia of seven or eight days he had a well-marked relapse of about two weeks' duration. During convalescence he began to complain of severe pain in the back of the neck and at the attachment of the muscles of the occipital bone. There was no actual tenderness in the vertebræ, and movements to and fro and laterally were not associated with any very great pain. An application of the Paquelin cautery relieved it for a few days, and then it recurred. The examination from the pharynx was negative. The condition persisted for at least two weeks, and, while at first confined to the neck, subsequently he had soreness and stiffness of the back; he walked stiffly and held himself very erect. He says that it is better when moving about than when lying down. No special tenderness in the spine; no sharp pains; no increase in the reflexes; no indication of neuritis. He gradually improved, and when discharged he was very much better, having gained eleven and one-half pounds in weight.

¹ Transactions of the Association of American Physicians, vol. III., 1888.

ON THE MICROBIC ORIGIN OF CHOREA: REPORT OF A CASE, WITH AUTOPSY.

BY CHARLES L. DANA, A.M., M.D.,

PROFESSOR OF NERVOUS AND MENTAL DISEASES, NEW YORK POST-GRADUATE MEDICAL SCHOOL.

THE more recent studies of the pathology of chorea have led to a practically unanimous conclusion that the seat of the disease is primarily in the bloodvessels and the blood, with secondary degenerative changes in the parenchyma, and that the cause is either some microbe or toxic substance, or both. The evidence regarding these points was collected by me in an article on the pathological anatomy of chorea published in *Brain*, April, 1890.¹ Since then an article on chorea with a contribution to its germ theory has been published by Dr. Henry J. Berkley in the *Johns Hopkins Hospital Reports*, 1891, vol. ii., No. 6. The examination of Dr. Berkley's cases led to the opinion that they were of infectious origin.

The anatomical seat of the disease probably varies. The principal changes are in the brain, and are sometimes chiefly in the cortical and sub-cortical motor areas, often perhaps in meninges as well as cortex.

The case I present seems especially valuable because it was originally a typical case of Sydenham's chorea; the lesions are distinct, and a very careful bacteriological examination was made with fruitful results.

The case has also a clinical value because it shows the gradual evolvment of a motor disorder not strictly like chorea, yet developing upon a perfectly typical attack of that disease.

SUMMARY OF THE CASE.—*Male, aged thirty-four years; family history good; acute rheumatism at tenth year, Sydenham's chorea at fourteenth year; repeated attacks of the same disease every two or three years, final attack eight months before examination; general violent choreic movements, affecting face, tongue, neck, especially, but also arms, trunk, and legs; tonic spasms in neck and back at times; rhythmical movements of head and arms at times; no paralysis, no anæsthesias or pains, no endocarditis; general nutrition fair; mental development good; cessation of movements during sleep; death from exhaustion. Autopsy: chronic lepto-meningitis of convexity of brain, hyaline bodies in brain cortex, slight meningitis of the upper part of spinal cord, slight meningo-encephalitis; diplococci found in the proliferating tissue between meninges and brain; heart normal.*

Bernard E.,² aged thirty-four years, merchant; admitted November 3, 1891. Family history good; father and mother still living; one sister and one brother died in infancy. No chorea in family.

¹ Richter (*Western Lancet*, vol. xii. p. 529) found cocci in the blood in a case of chorea. Donkin (*Brit. Med. Times and Gazette*, 1884, vol. ii. p. 743) found some rod-like bodies in the tissues. Naunyn (*Mitth. a. d. med. Klin. zu Königsberg*, 1888, p. 296) found fungi in the pia.

² This patient was kindly referred to me by Dr. R. H. Sayre, to whom I am also indebted for important notes regarding the history.

Previous history. Patient suffered in childhood from chickenpox and measles. At ten years he had a severe attack of rheumatism that kept him in bed for six months; this involved his knees, ankles, hips, and shoulders. Between ten and fourteen years he was well, except for occasional returns of his rheumatism.

Present disease. At fourteen his symptoms of chorea began; first with feelings of muscular uneasiness, then followed by irregular, twitching movements, noticed first in left hand and left side of neck. These spread so as to involve the greater part of the body, but continued more marked on left side. Attack resembled the ordinary form of chorea of Sydenham. After a few months there was a remission, but the disease returned every two or three years and was so severe as to keep the patient in bed for five or six months. Between the attacks the symptoms were slight. The present attack began in March, 1891, eight months before I saw him.

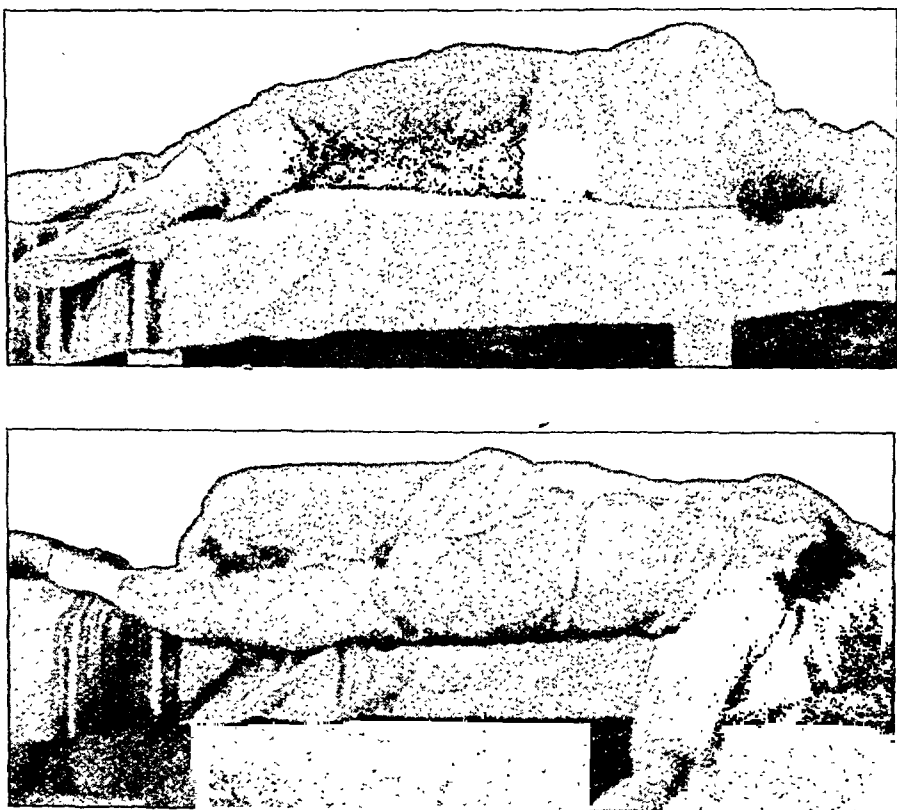
Status præsens. Patient was a man of average height and fairly well nourished; he was able to walk, but did so with some difficulty. He suffered continually from jerky movements of the face, neck and arms, and the trunk of the body; the legs also were somewhat involved. These movements were in the main choreic in character; the head would be jerked back and sideways, the facial muscles would twitch; the tongue movements were so active that speech was indistinct. There were occasional spasmodic twitchings of the eye muscles, producing conjugate deviation usually. The muscles of the neck, particularly the sterno-mastoid and deep rotators on the left side, were greatly involved. The arm movements were irregular and incoördinate; occasionally there was a marked tremor in them. The movements were especially those of flexion of the wrist, flexion and extension of fingers, pronation and supination of the wrist. The trunk of the body was affected, more particularly the movements of the back; the head would be carried back so that for a moment he would be held in a condition of opisthotonos. In the latter stages of his illness this involvement of the muscles of the back became particularly severe, so that the patient would suffer practically for several days from a condition of opisthotonos, or what might be called clonic opisthotonos, the body being arched back so that he could only lie on his side in bed. The continual movements of the body made it difficult to secure a satisfactory photograph: Fig. 1, however, gives some idea of the nature of the affection. The muscles of the body were well developed, particularly those of the neck and back, and there was nowhere any sign of paralysis. The dynamometer with the right hand registered 50°, left hand 45°.

There was no anæsthesia or hyperæsthesia and no tenderness or points of pressure which gave relief from the spasm. The reflexes were normal so far as could be ascertained. There were no trophic or vasomotor disturbances. The patient slept fairly well, and during sleep the movements ceased. He had no headaches that he particularly complained of, and his mind was clear. He was an intelligent man, but very much and very naturally depressed over his malady. He had later in his disease considerable pain during the more severe spasms which affected his back. The lungs, heart, kidneys, and abdominal viscera were normal. He had no rise of temperature.

Patient was placed upon large doses of chloral together with tonics; these gave him some relief, but produced no permanent benefit.

Various other measures, including iodide of potassium, hyoscine and anti-spasmodics, and morphine, were employed without any special benefit. One month after admission, in a fit of depression, the patient attempted suicide by cutting his throat with a safety razor. He was discovered by the nurse before he had accomplished the deed and was transferred to the surgical side for treatment. He had managed to cut one of the sterno-cleido-mastoids nearly across, and the constant movements of the parts made the healing of the wound very slow. He gradually recovered, however; but shortly afterward, on January 10, 1892, he suddenly and unexpectedly died, a little over two months after admission, and ten months from the beginning of his last severe attack. His disease had lasted with remissions for twenty years.

Fig. 1.



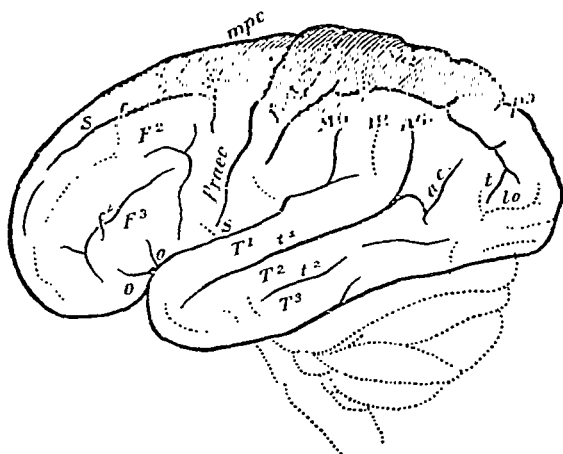
Chronic chorea, showing attitudes assumed during the spasmodic movements.

The autopsy was made next day by my house physician, Dr. Gwathney, to whom I am much indebted for the details of this case.

Body slightly emaciated; rigor mortis marked. Lungs showed some œdema and hypostatic congestion; calcareous concretion in left pleura about the size of a chestnut. Kidneys showed cortex diminished, some congestion, markings fairly plain, capsule slightly adherent; they presented the appearance of some diffuse nephritis, chronic in character. Stomach showed increase of interstitial tissue; no marked congestion. Spleen and intestines normal; liver much congested.

The *brain* was large, weighing fifty-four ounces. The dura mater was not adherent and appeared normal. No excess of fluid in the cavities. The brain was considerably congested. The bloodvessels at the base were normal. Over the convexity of the hemispheres on both sides was a granular thickening of the pia mater and arachnoid. This presented the appearance of a chronic proliferative meningitis; it reached from the base of the first frontal convolution back to near the occipital lobe; it extended down nearly half-way on the great convexity of the brain and also about half-way upon the median surface. On cutting through the membrane here it was found to be thickened and slightly attached to the surface beneath. It was impossible to get the spinal cord, but a portion of it, extending to about the fourth cervical, was cut out through the foramen magnum. The pia mater about the cervical cord and medulla seemed somewhat thickened and congested. The brain was hardened in Müller's fluid for about three months, and portions of the cortex were stained in carmine and Weigert's solution of hæmatoxylin. A section of the hemisphere involving the thickened meninges was cut out and placed at once in alcohol and there hardened. This was subsequently stained and examined for bacteria by Dr. Brooks, of the New York Post-Graduate Laboratory. Dr. Brooks made a very large number of examinations of the membranes, and I am greatly indebted to him for his painstaking investigations.

FIG. 2.



Showing area of lepto-meningitis.

Microscopical examination. The parts examined microscopically were mainly the superior parietal lobule and upper central convolution, as it was these parts that were most severely involved in the process. Examinations were also made of the basal ganglia, the internal capsule, and a series of sections was made extending down through the pons and medulla and upper part of the spinal cord.

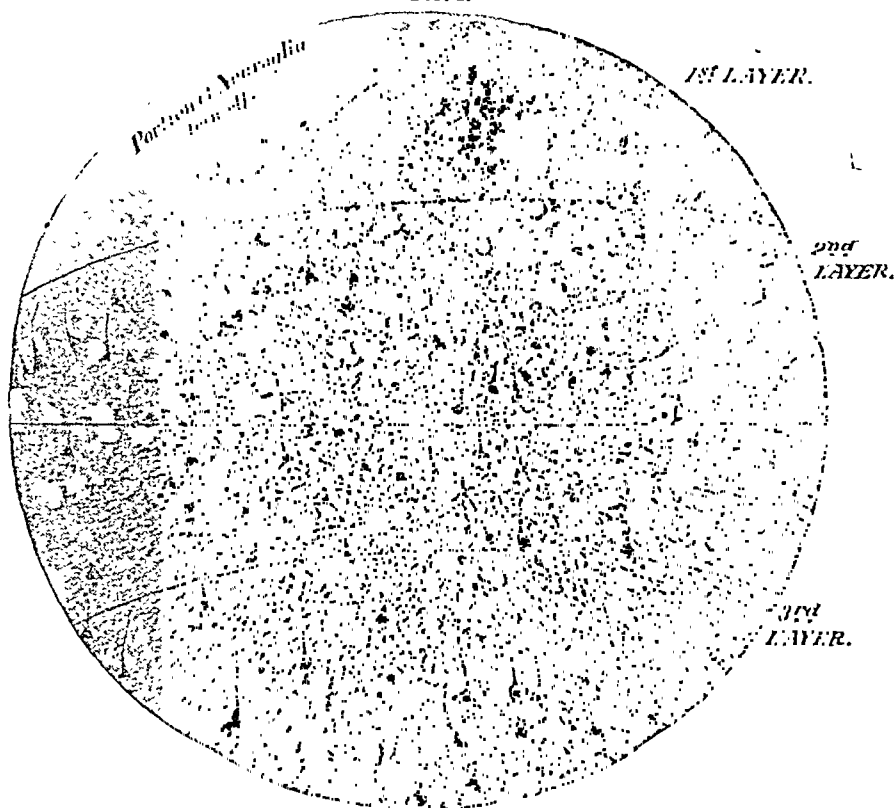
The detailed notes are as follows:

Superior parietal lobules. The pia mater is thickened, this being due to a rich connective-tissue proliferation; but there is no exudate or round-cell infiltration. It is simply a chronic proliferative thickening. (See Dr. Brooks's report.) (Fig. 2.)

The superficial or neuroglia layer of the cortex shows, in some areas, distinct softening or degeneration with a rich cellular infiltration, apparently coming from the meninges. This infiltration does not extend beyond the neuroglia layer. The vessel walls are slightly thickened, and there is perivascular dilatation in the outer and small pyramidal layer.

In the specimen which was hardened in alcohol alone, numerous large hyaline masses were seen, both in the pia mater and just below it, extending in smaller numbers as far as the second layer of the cortex. These masses do not stain; they are irregular in size, but average $\frac{1}{100}$ inch in diameter. They are evidently *artefacts*, yet indicate a morbid condition of the nervous tissue. They lie sometimes around, but not in, the vessels.

FIG. 3.



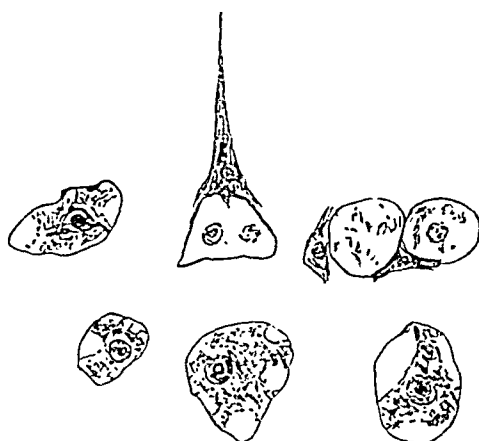
Section from superior parietal lobule, stained with carminate of soda and osmic acid. Photographed by Dr. J. H. Smith; bromide enlargement; details added. $\frac{2}{3}$ objective.

The specimens hardened in Müller's fluid do not show these bodies. In these latter specimens, however, including those hardened in osmic acid and bichromate of potash, a different kind of hyaline bodies is seen. They are found chiefly in the second (angular cell) and third (small pyramidal) cell layers of the cortex. They are round or nearly so, translucent, and do not stain in carmine, hæmatoxylin, or osmic acid. They are about $\frac{1}{1000}$ inch in diameter. In the centre of most of these there is a nucleus. They appear to be neuroglia or pyramidal cells undergoing some degenerative change (see Figs. 3 and 4).

There are places where it seems as if one could see a pyramidal cell undergoing a hyaline degeneration (Fig. 4, *a, b*), but of this I cannot feel certain. The bodies do not (like the large hyaline masses) seem to stand in any relation with the bloodvessels.

It was in these regions where these degenerative changes were seen that micro-organisms were found as detailed below. The nerve cells proper do not show any decided changes, at least with any stains I was able to use (carmine, logwood, osmic acid, methylene-blue). The outlines were sharp and nuclei distinct. Here and there, however, it seems as if the hyaline change was attacking a cell (see Fig. 5). The bloodvessels show no decided change either as regards thickening, dilatation or proliferation.

FIG. 5.



Drawings of hyaline bodies and pyramidal cell as seen by $\frac{1}{6}$ and $\frac{1}{12}$ objectives.

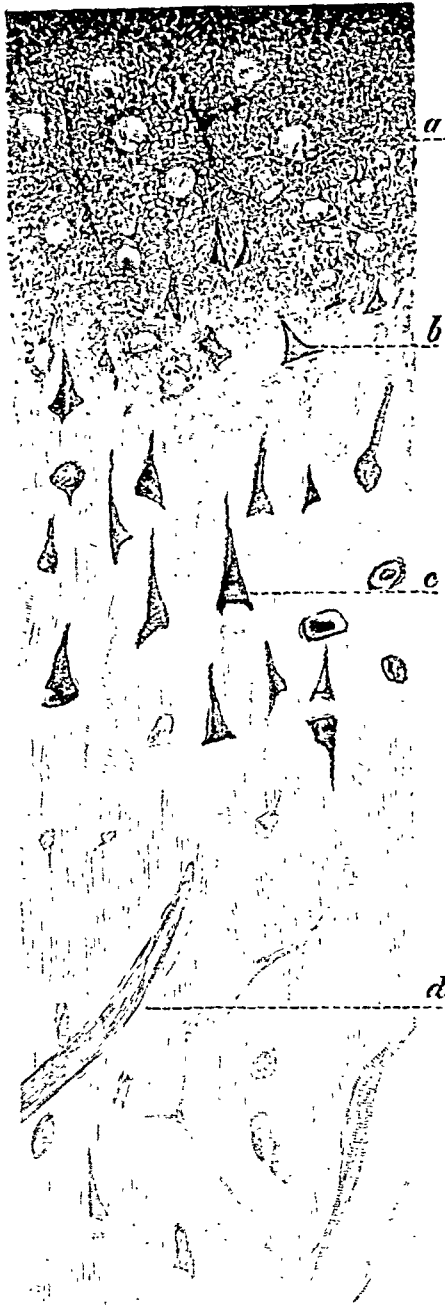
The changes above described were found to exist in all parts of the cortex where there was meningeal thickening, but were much more pronounced in the superior parietal and upper central convolutions. Other parts of the cortex were normal.

Sections of the lenticular nucleus, and particularly of the putamen, show considerable vascularity, and a few of the *small hyaline bodies* such as are seen in the cortex. These bodies are still more numerous in the claustrum, however, and the external capsule. The substance of the pons and medulla is nearly normal. There is some congestion of the nerve nuclei, but the fibres and cells are normal and no hyaline bodies are seen here.

At the exit of several of the cranial nerves, particularly the seventh and sixth, the meninges are much thickened; the arteries show a peri-arterial proliferation of rather active character; their walls are thick, and small hemorrhages can be seen in them. One root of the vagus seems much more congested than the other and contains a few degenerated fibres. The anterior cornua at the level of the first cervical are congested and the cells much pigmented, but not seriously injured. At the decussation of the anterior pyramids there is an artery lying in the posterior median groove having very thick walls and showing a *proliferation of the intima cells*, also a peri-arteritis. Other arteries in this neighborhood show a very striking peri-arteritis.

The hypoglossal nerve in this neighborhood is normal in its course

FIG. 4.



Chorea. Bacteriological examination.

Section of parietal lobule, stained with carminate of soda and osmic acid. Drawn from 1/5th objective. a. Hyaline bodies. b. Small pyramids. c. Large pyramids. d. Bloodvessel.

through the medulla, but after its exit shows much vascularization. Section shows thickened sheath with some proliferation of endoneurium cells.

The spinal branch of the spinal accessory shows the same condition even more strikingly. There are inflamed vessels, a perineuritis, and interstitial neuritis of a slight degree. These meningeal and vascular changes seem much less high up in the pons.

Bacteriological examination. Portions from the cortex of the upper central convolutions were placed at once in alcohol and hardened. These were submitted to Dr. H. T. Brooks, bacteriologist of the Post-Graduate laboratory, who made the following report:

Sections were stained in logwood, Bismarck-brown, carmine, and the Weigert stain for micro-organisms. Sections showed small, irregularly circumscribed areas of disintegration of brain substance, of varying size, extending over greater part of section and reaching to within a short distance of peripheral layer. These areas are composed of finely reticulated basement substance enclosing a more or less homogeneous material. Some areas are composed wholly of this tissue, while others (generally the smaller) include rounded, vesicular and granular nuclei, which take on intense staining. No bacteria could be demonstrated here.

The meninges showed some thickening and in certain portions slight evidence of proliferation; there were no exudative elements in this part, though rarely a small diplococcus could be made out, and when seen was invariably isolated. These organisms were confined to inner surface (portion) of membrane.

In that portion of the cortex immediately below the junction with the meninges a few small diplococci, resembling in every detail those present in brain covering, were seen, never more than two occurring in a field of $\frac{1}{2}$ oil-immersion (Leitz).

The micro-organisms were about half the diameter of a red blood-cell, and resembled very closely the *diplococcus lanceolatus*. Though not in large numbers, they were found in all the sections, and always in the deeper layer of the pia and superficial part of the cortex.

RÉSUMÉ.—There is a meningitis of the cortex which extends into and in places involves the cortex. It is characterized by an active connective-tissue proliferation and the presence of diplococci in the meninges and cortex. In the cortex are small hyaline bodies which indicate a degenerative change of the brain substance. This degenerative change affects the deeper parts of the brain to a less extent, extending down into the capsule and lenticular nucleus, but not the optic thalamus. There is a meningitis with active vascular changes in the upper part of the cord which seems particularly to surround and affect the roots of the nerves as they leave the medulla and the cord.

It seems to me that the teachings of this case are very important in many ways. First of all, it shows us that there is a close relationship between many of the chronic spasmodic disorders of irregular type and the chorea of Sydenham. Secondly, it confirms the view already generally accepted, that chorea is a vascular and humoral disease. Third, it gives weight to the belief held by many that there is, in some cases at

least, a microbe which produces this disease. Fourth, it shows that in these cases the seat of the lesion is either meningeal or superficially cortical so far as the brain is concerned, and that as regards the spinal cord the seat of the lesion is mainly in the meninges and bloodvessels, where it apparently surrounds and irritates the roots of the nerves.

Finally, we cannot explain chorea by finding any particular *seat* of the disease, though the voluntary motor tract in the brain must at some point be involved.

Neither has chorea any special form of anatomical change invariably associated with it, though degenerative hyaline change and evidences of vascular irritation are most common.

There must be, in order to produce chorea, a specific kind of irritation of the cells. This need not be of one kind; it may be a rheumatic poison or a diplococcus toxin. But the specific irritants are not numerous, for though the motor fields undergo innumerable forms of injury and disease, chorea occurs but rarely, and only when the proper regions are properly irritated. There is nothing which would explain the phenomena of the disease so well as to suppose that the specific agent producing chorea is a microbe, and perhaps some form of the diplococcus.

The various types of chronic chorea would be explained by the changes in the intensity of the irritation, its special localization, and the degree of organic change which it eventually induced.

FOUR CASES OF BRAIN TUMOR, IN THREE OF WHICH OPERATION WAS DONE—TWO OPERATIVE RECOV- ERIES—ULTIMATE DEATH IN ALL.

By W. W. KEEN, M.D.,

PROFESSOR OF THE PRINCIPLES OF SURGERY AND OF CLINICAL SURGERY,
JEFFERSON MEDICAL COLLEGE.

FROM the diagnostic point of view the present great need is the means of determining the presence and the exact location of an intra-cranial tumor; from the operative point of view, when a tumor has been found, the means of knowing when to proceed to its removal and when not to attempt it, or, if it has not been located or not found, whether a palliative exploratory operation is wise.

The following cases are put upon record with a view of adding to our means of deciding these points. In the first case, the situation of the tumor was probably located correctly and trephining afforded a very great relief to most distressing symptoms. In the second, the tumor was almost exactly located, but, from the probable size and position of the tumor, and the condition of the patient, it was decided not to operate—a

conclusion justified by the post-mortem. In the third, the position of the tumor was erroneously diagnosticated, and an unwise operation was followed by death. In the fourth, the tumor was not recognized at the operation but was found at the suspected site at the post-mortem; the operation, while it could not afford relief, did no harm.

CASE I. *Intra-cranial tumor, probably of the occipital lobe; trephining followed by operative recovery, with relief of headache and mental hallucinations; death.*—R. M. B., aged thirty-one years, Abingdon, Washington Co., Va. First seen by me with Dr. George E. Wiley, March 26, 1892, at the Orthopædic Hospital and Infirmary for Nervous Diseases. Family history good; syphilis denied. Up to August, 1890, his health was good; but at that time he walked for some distance exposed to the sun on a very warm day, carrying one of his children. For several days after this he was drowsy and stupid and slept a great deal, and later complained of severe headache and pain in his head. There was no nausea, vomiting, or vertigo. About ten days later he had a convulsion, and three days after this a second attack. The attacks were not followed by paralysis or stupor. He rallied and got up again, but ever since has suffered from constant and severe headache and occasional convulsions, the headache being generally much severer before an attack.

His sight, hearing, memory, and ability to express his thoughts are much impaired, noticeably so since last autumn. His hearing was not good, however, before the convulsions. His eyesight varies, and at times he seems to see fairly well, while at others he is apparently almost blind. He has also lost the power of writing, the loss being mental and not muscular. He walks moderately well, though occasionally both knees "give way." He sometimes has lucid intervals, and talks quite rationally. Lately there has been considerable vomiting, but his physician thinks this may be due to the medicines he has been taking. His attacks have occurred at the following times: two in August, 1890; one January 22, one April 5, one June 4, one in July, 1891; one January 20, 1892; two in succession March 6, and the last one March 24, two days ago. There has been no paralysis after any of the attacks.

Status præsens, March 26th. A fairly well nourished man, who practically complained of but two things, blindness and intense headache. His pupils were very widely dilated, but he was only able to observe a slight difference between total darkness and three bright gas-lights directly in front of him. The headache he located just above the line of the lateral sinus and a little to the left of the middle line. Percussion and pressure at this point, as at other points on the skull, were not painful. He was able to walk when guided, though he did not seem to walk firmly. This, however, may have been due to his mental uncertainty resulting from his blindness. Absolutely no localizing symptom was present. A careful examination of the eyes showed marked double optic neuritis with other details, but unfortunately the notes, which should have been entered in the hospital case-book, have unaccountably been lost.

Diagnosis: An intra-cranial tumor, which cannot be located. Treatment: Trephining was recommended, with a view to relieving his intense headache. It was determined, after consultation with Dr. S. Weir Mitchell, to do this at the point of localized headache. If the tumor be found, such surgical measures as seem proper will be followed.

If no tumor be found, or if when found it should be inoperable, the dura will be closed and the bone will not be replaced.

Operation, March 31, 1892. An inch-and-a-half button of bone was removed over the left occipital lobe, and the bone gnawed away until the opening measured 2.5 by 1.5 inches. The dura was divided semi-circularly, and the moment this was done the brain bulged very markedly. Pulsation was not very visible, but was perceptible by touch. The cortex appeared to be normal. I passed my little finger between the brain and the dura all around the opening for an inch, and believed that I felt more resistance down toward the tentorium than elsewhere. Accordingly, to search for the probable tumor, I made a small incision with a knife through the cortex and passed my little finger gently into the brain for a depth of one inch. I was still convinced that there was great resistance toward the tentorium, but no distinct tumor was perceptible to the touch. Gently withdrawing the finger, I now cautiously inserted a grooved director in the direction of the cerebellum. At a depth of an inch and a half I met with quite noticeable resistance, which was overcome with slightly greater pressure. The pressure seemed to diminish again at a depth of 2.5 inches from the surface. I believed, therefore, that I probably had to deal with a tumor lying an inch and a half below the cortex, and although I could not define its size, the amount of bulging was so great and increased so much that I came to the conclusion that the tumor was a large and, therefore, irremovable one.

Accordingly, I now endeavored to close the dura. This I found a task of great difficulty. I had fortunately provided myself with a teaspoon and a tablespoon, both sterilized by boiling. I inserted the handles of these under the dura, and gradually, by means of them and my fingers, was able to press back the cerebrum to a certain extent, so that I could approximate the edges of the dura, although I could not bring them into contact. In doing this about a tablespoonful of the brain tissue was necessarily lacerated and removed. During the entire operation the bulging increased continually, until when I decided to close the dura at least as much brain as would correspond in size to an English walnut was protruding. The greatest gentleness was used throughout, but in spite of this considerable laceration occurred, especially in the attempt to reduce it. The bone was not replaced. The flap was sutured in position without drainage.

His further history was very interesting. At first there was considerable pain in the right arm, which became oedematous and congested for several days, and also in the right leg. The dynamometer showed a difference of muscular power, varying in the right hand from 40 to 60 and in the left from 80 to 90 degrees. Sensation and motion in the right arm and leg were moderately diminished, especially on the inner side of the right forearm, and were entirely absent on the extensor surface. Gradually, however, this disappeared to a large extent. His highest temperature after the operation was 99.6°. The wound itself healed by first intention throughout.

The changes at the site of operation and in his mental condition were most important and interesting. From the moment of the operation his headache entirely disappeared, and had no other improvement taken place, this alone would have justified and have repaid him for the operation, with its attendant risks. Moreover, all his hallucinations disap-

peared, and he became a quiet and tractable patient. Within a few days after the operation marked bulging took place where the bone had been removed. This was presumably due to a large extent to cerebro-spinal fluid, but probably also partly to a subcutaneous fungus cerebri. The annexed photograph (Fig. 1) shows well the curious shape of his head as a result of this bulging. The bulging was so great that I feared at first the cicatrix would give way and we should have an open fungus cerebri, but fortunately the union was sufficiently firm to resist the pressure, and although about six weeks after the operation, on several occasions, a pin-point rupture occurred in the line of the cicatrix, this gave no further trouble than the discharge of two or three ounces of cerebro-spinal fluid.

FIG. 1.



Shows the peculiar shape of the head from bulging of the scalp at the site of the trephining from a subcutaneous fungus cerebri and accumulated cerebro-spinal fluid. The ends of the incision also are shown. (Photographed by Dr. Wm. J. Taylor.)

The patient was discharged from the hospital seven weeks after the operation. By a letter from Dr. Gammon, his physician in Virginia, I learned that he died on August 9, 1892, four and a half months after the operation, having been relieved of his distress by it, but without the possibility of saving his life. Dr. Gammon was kind enough to send me his brain, but unfortunately by the time it reached me, the weather being excessively hot, it was in such a state of decomposition that no examination of it was possible.

There would seem in this case to be no doubt as to the diagnosis of cerebral tumor, although unfortunately the decomposed condition of the brain makes a positive assertion on that point impossible. The case is noteworthy, as, although not curative, it was exceedingly successful in palliation. The relief to the headache alone was to the patient a boon

worth any risk, and when to this is added the entire disappearance of his delusional insanity, the operation becomes still more commendable. When he first entered the hospital it was necessary to keep a special nurse constantly at his bedside, lest harm might result from his delusions. After the operation he was treated as any other patient, and required only the ordinary nursing of an operative case.

The shape of his head, as a result of the operation, is very peculiar. It is due, I believe, partly to cerebro-spinal fluid, but largely to a fungus cerebri existing under the scalp. Since his case I have had another of compound fracture, with a large loss of bony tissue, in which precisely the same deformity in the shape of the head has followed, and which has thrown light on the deformity. In this latter case, some months after the injury, I was obliged to remove a large piece of necrosed bone, and in doing so was able to investigate the contents of the tumor, and found it partly liquid and partly made of the fungus cerebri itself.

Two remarks from an operative point of view seem also to be demanded: First, that tumors which are inoperable should be meddled with as little as possible. Warned by past experience, especially by one case in which death followed a too extensive interference upon my part, I made up my mind that in such a tumor as this, large and deep, I would not attempt to do too much. The wisdom of the slight interference which I practised is, I am sure, emphasized by the result.

Secondly, I would call especial attention to the value of the amount of bulging of brain as an indication of the size of the tumor. Of course, the bulging is really only the measure of the increased intra-cranial pressure due to tumor, accumulation of fluid in the ventricles, etc., but in cases of tumor the amount of bulging will be chiefly due to the tumor itself, unless it has produced an acute internal hydrocephalus. The amount of bulging, therefore, will enable us to some extent to decide on the wisdom of greater or less interference in such cases. In another case (not yet published because not yet terminated) somewhat similar to the present one, where it was certain that there was great increase in the intra-cranial pressure, I made an initial incision into the dura only one inch in length, which I intended to enlarge if examination of the brain itself showed it to be wise to do so. Through this I explored for the supposed tumor, and failing to find it, but discovering greatly increased pressure and marked tendency to escape of the brain tissue even through this small opening, I closed the dura without any laceration of the brain tissue other than that produced by the punctures. The patient made a rapid and steady recovery, and has been free from headache and other tumor symptoms since. Had I opened the dura freely in this last case I am sure that I would have had the greatest difficulty in replacing the brain tissue within the dura, and very likely it would have been even impossible to do so. Not only one but, if

desirable, two or more small openings could be made to search for such a growth. Very possibly death might have resulted had I not been so cautious.

CASE II. *Glio-sarcoma of upper motor area; no operation; death.*—N. F., aged seventeen years, was first seen in consultation with Dr. R. M. Girvin on October 1, 1889. On October 3d Dr. Morris J. Lewis saw him at our request, and was kind enough to write out the following history as obtained at our various visits: "In November, 1886, the patient fell from the roof of a stable, a distance of about twenty feet. The fall broke his right thigh and left forearm. He also struck his chin, cutting it severely, and knocked out one of his front teeth. He was not known positively to have struck his head, although he was rendered unconscious by the fall, and remained so for some time. The next day all symptoms of concussion had passed away. He was treated in the University Hospital, and made a good recovery. After this accident he became a very wild boy. Several attempts were made to find a suitable school for him, and finally he was sent to a military academy.

"His family history is as follows: Paternal grandmother died of consumption, maternal grandmother has diabetes, a maternal uncle who during the war was twice wounded in the head, involving the brain, committed suicide; his father is frequently troubled with attacks of asthma; one of his sisters has hay fever, and the patient has had several attacks of asthma and bronchitis and chronic nasal catarrh. Nothing else worthy of note occurred in the patient's history until the above accident. He never remembered being struck on his head. Two years ago he had an abscess in his left ear; this, however, only discharged for a few days, and gave him no further trouble.

"In April, 1889, nearly two years and a half after his fall, his right leg began to feel weak, the knee at times giving way under him. This condition was not constant, but would come and go, lasting but a few moments at a time. About the same time, but certainly after the leg, the arm became affected in a similar manner, the weakness being always most marked in the leg. These attacks did not occur simultaneously in both limbs, but alternated with one another. His right eye at this time was congested, and hurt him to use it, so that he read with this eye covered. Headache was also present, and was so severe that he had to apply ice-bags to his head in order to be able to study. He also had several hysterical attacks at this time. He was now seen by a well-known surgeon, who prescribed a brace for his knee. He came home in June, having completed his examinations, complaining of weakness in the leg, and dragging it slightly when he walked; his arm was also giving him occasionally more inconvenience. At one meal, perhaps, he would be unable to use a knife or fork, while at the next he would have no difficulty. After this he began to have numbness around his mouth on both sides, particularly at the corners, and occasional numbness in his leg. About the latter part of June his headache, which had been more or less constant, began to be more severe; he would awaken between 2 and 5 A.M. with intense pain in the frontal region. This would generally pass off in a few hours, and eating always relieved it. Nausea and vomiting were also distressing symptoms at this time, occurring two or three times a day. With these attacks his face would become very much flushed, and the veins would stand out prominently.

Pressure seemed to give relief. About this time he had a long siege with the dentist, and seemed much exhausted by it.

"In the middle of July, 1889, he was noticed to be constantly covering one or the other eye with his hand, as if to obtain a single vision, and soon afterward awoke with marked internal strabismus of the left eye. This lasted for three or four weeks, and left suddenly. On one or two occasions in July he had transient attacks of paresis of right face, arm and leg, and had some trouble in remembering words. Hallucinations were occasionally present. By the latter part of August he had become very weak, had constant nausea, and was very constipated, once going fourteen days without a passage.

"On September 8th, after marked flushings of face and headache, he had an attack as follows: He rolled over on his right side, drew back his head and became unconscious for a moment or so; he uttered no cry, did not bite his tongue, and no convulsive twitchings were seen, neither did any part, except his neck, become rigid. He was not stupid after the attack; he could talk well, and no change in the paretic side was noticed. After this he was very weak and had extreme nausea.

"On September 17th he had a second attack; there was no warning except an increase of headache, he rolled over on the right side, uttered no cry, threw back his head, turned the face to the left, and thrust out his tongue, to which side is not known. There was also marked opisthotonos; no movements occurred in the paretic limbs, but he moved the left arm back and forth, and drew up his left leg. His face was purple and his breathing stertorous. Heavy sleep followed this attack, and he was stupid for a week or more. During this time he took no notice, did not speak, and had incontinence of urine; there was also great trouble in deglutition. He then began to recover; his nausea stopped, and he began to talk of food. There was no aphasia.

"Since July, the time of the appearance of the squint, he has not seen well, but not much attention was paid to this symptom until September 28th, when for two days he said he could not see. It is reported that during the summer his pupils responded well to light, although they were quite large—as, in fact, they have always been. On the 27th of September Dr. Girvin found that the pupils responded slowly to light, but that two days later he could obtain no response. During the summer Dr. D. Hayes Agnew saw him and made a diagnosis of intracranial tumor, but deemed it inadvisable to operate.

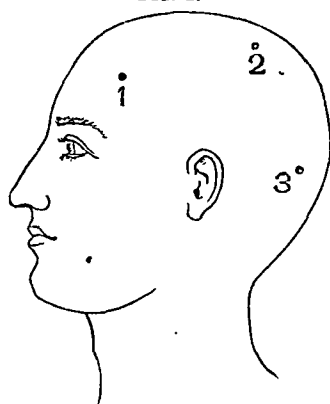
"*Status præsens*, October, 1, 1889. He has just had an increase of the headache and has been vomiting freely; he is in consequence much weaker and more listless than common. His eyeballs are quite prominent and the pupils widely dilated, the left being slightly the larger. There is slight divergent strabismus of both eyes, the right eye being turned up more than the left. Slight ptosis of both lids exists, although he can move the lids with moderate freedom. When the examination began he was unable to move the eyeballs in any direction except upward, but before it was finished he could move the balls downward a little, and also outward, the left eye moving outward better than the right. There was decided paresis of the lower portion of the right facial nerve; very slight of the upper portion. He is said to have always laughed on the right side of his mouth. The tongue is thrust out perfectly straight. The right side of the palate is paretic; there is decided rigidity of the neck, an attempt to flex the head on the chest lifting the shoulders and

causing pain, rigidity of the muscles being equal on both sides; almost complete paralysis of the right shoulder muscles exists. He is able to move the forearm, wrist, and fingers feebly. Dynamometer: left, 27; right, 3. Right leg almost completely paralyzed; can only flex the thigh feebly on the abdomen, with the tendo Achillis contracted, the foot extended and the toes slightly extended. Sensation and localization are but little if at all impaired. The ankle-, knee-, and elbow-jerks are absent on both sides; the plantar reflex slight on both sides, on the right consisting of extension of the toes; the cremasteric, abdominal, and epigastric reflexes are all diminished on the right side, good on the left.

"Left calf measures $9\frac{1}{4}$ inches; right calf, $8\frac{3}{4}$ inches; left thigh measures $12\frac{1}{2}$ inches; right thigh, $11\frac{1}{2}$ inches. Lungs, normal; heart, accentuation of second sound at right cartilage, no murmur; action at times irregular, eighty beats to the minute. There is pain over the left brow, with occasional flashes of light. The veins over the forehead are prominent, particularly over the left temple. There is slight œdema of the scalp, equal on both sides. There is slight incontinence of urine, and marked constipation.

"The pulse is said to have varied from 45 per minute, to 120, the slow pulse occurring before, and the rapid after an attack. There is a tender spot on the scalp, which has only appeared during the last few days; it is situated one inch to the left of the longitudinal fissure, and about one inch behind the upper end of the fissure of Rolando. This is not the seat of spontaneous pain, but percussion causes decided inconvenience.

FIG. 2.



Points at which the surface temperature was taken.

"October 3d, patient is decidedly brighter, talks fluently, and takes an interest in his surroundings. Attempts to flex the head still encounter resistance and cause decided pain at the ensiform cartilage. Temperature of right temple, 95° ; of left, 96° . That of the scalp cannot be determined, as the hair is long. This also interferes with the determination of the percussion note. He hears well on both sides. The sense of taste appears unimpaired. He cannot recognize the odor of vinegar, brandy, or paregoric, but notices, and after some hesitation recognizes ammonia. Mistakes alcohol for Florida water.

"He had a great deal of headache this afternoon, said to be caused by the barber shaving his head. He refused to allow anyone to talk in the room, and percussion of the skull was out of the question. No scars are

visible. Just over the site of the posterior fontanelle there is a swelling the size of half a large grape, evidently a distended vein or veins, easily dispersed by pressure, but immediately returning. No signs of an opening in the skull and no tenderness at this spot.

"The surface temperature was carefully taken, the thermometer being held in position for eight to ten minutes each time; a second record was taken over the tender spot (marked 2 on diagram) for accuracy. With the exception of this spot the left side of the head is the warmer. (Fig. 2.)

"Temperature, October 3, 1889: Left axilla, $98\frac{1}{4}^{\circ}$. 1. Left temple, $94\frac{3}{8}^{\circ}$ (October 2d, 96°); right temple, 94° (October 2d, 95°). 2. Tender spot near left parietal prominence, 96° ; analogous spot right side, $96\frac{1}{2}^{\circ}$. 3. Occiput, left side, 97° ; occiput, right side, $96\frac{1}{4}^{\circ}$."

Dr. Charles A. Oliver made the following report upon his eyes:

"The patient was first seen on September 30, 1889. His family gave the following ophthalmic history: On July 15, 1889, the left eye suddenly 'turned in,' and as quickly straightened three weeks ago. On September 27, Dr. R. M. Girvin examined the pupils and found that the irides responded to light-stimulus. On the following day the patient became suddenly 'blind.'

"Careful examination showed that the vision of the right eye, which was reduced to the faintest light-perception, was distinctly hemianopic in type; the blind half of the field being upon the right side. The field of vision of the left eye, which was larger than that of the fellow eye, was also hemianopic in character; with a large double curved line separating the seen portion to the temporal side (fair light-perception) and the unseen portion to the nasal side. The pupils were evenly and fully dilated, and the irides were absolutely immobile to light-stimulus thrown from any point whatever, even from any portion of the remaining fields of vision. Although it was impossible to obtain any subjective study of the movements of the ciliary muscle, yet the catoptric test, carefully though, of course, roughly applied by the use of a moving candle-flame and a proper magnification of the reflexes, failed to show any movements or changes in sizes of the flame-images upon the anterior and the posterior poles of the lenses. The separated and the conjoined movements of the extra-ocular muscles showed that the superior recti performed the greatest excursions (about four millimetres each from a supposed primary position of the eyes); the inferior recti, about three millimetres each; associated movements of the two globes to the right, about one or two millimetres; associated movements of the two globes to the left, almost disappeared; and attempts at binocular convergence absolutely gone.

"The ophthalmoscope revealed a marked choking of the optic disks (to about 4. D.) the summit of the swollen nerve-head tissue being to the nasal edges of the disk. The swellings, which appeared soft and cedematous and extended two disk-diameters' distance into the circumjacent retinal areas, were rendered quite red by numerous vascular enlargements. They were equal in degree and density. The retinal veins were tortuous, and the corresponding arteries were narrowed and reduced in size.

"The findings may be summarized as follows:

"1. Right homonymous hemianopsia, the greater loss of vision and the lesser area of remaining field being upon the right side.

"2. Binocular total irido-cycloplegia.

"3. Binocular partial external ophthalmoplegia more marked on the left side, and more pronounced with the third and the sixth nerve groupings.

"4. Double optic neuritis (soft and œdematous in character and very vascular in type), equal in apparent degree and density on the two sides.

"The subsequent changes are as follows: On the following day he was seen by Dr. Lewis, who, in addition to the general findings, noticed that the pupil of the left eye was the larger, and that although the inferior recti could perform better excursions than upon the day before, there was a marked double divergent squint.

"Two days later paresis of both levator palpebræ muscles appeared, causing marked ptosis; the upper lids being elevated by the compensatory action of the fronto-occipitalis muscle. The action of the compensating muscle, which was more pronounced on the left side, allowed the left lid to be elevated four millimetres, whilst the right lid rose but one millimetre. The right eye was now blind, and the left eye retained a small excentric field for strong light-stimulus to the outer side. The right eye was directed not only inward, but upward. The same eye, curious to say, presented the broader rim of iris.

"These facts suggested the following probable diagnosis:

"Pressure on both optic tracts, which is more pronounced on the left side with an upward pressure on the floor of the fourth ventricle, that is more marked on the left side, and extravasation of cerebro-spinal lymph into the intra-vaginal spaces of both optic nerves—significant of a tumor mass—occupying the lower portion of the left mid-brain."

October 7th. The following changes were noticed in his condition: His stomach is very much improved, and he had eaten a hearty dinner; he is hungry most of the time; ordered simple but nourishing diet every two or three hours. He can move both eyeballs in every direction, but not to the full extent. His ptosis is less marked. At present his vision is unchanged. His right arm he is able to move with considerable freedom in all its segments; his right leg he drew up quite well and almost completely; he could not flex the ankle; movements of the toes existed, but seemed not to be voluntary. The habitual position of the foot was in exaggerated extension of the ankle and the toes. The ankle could be flexed passively, the contracture of the calf muscles having apparently disappeared.

The tender spot on his head was located farther front than before, over the upper portion of the left Rolandic line. It was ill-limited, but distinctly tender on pressure. Sometimes a second attempt at pressure, after an interval occupied with other examinations, would not elicit tenderness. Some tenderness existed at nearly the corresponding area on the right side. Direct percussion of the skull by the finger-tip elicited no special area of tenderness; neither mediate percussion on my own finger, nor direct percussion by the finger-tip, elicited any difference in the percussion note. Lifting him up with the hand under the occiput, the neck was found to be somewhat stiff, but the head could be flexed to a moderate extent without producing any pain at the ensiform cartilage, and only moderate pain in the neck.

I examined very carefully into the question of possible syphilis. His family and himself both denied it, he himself with a frankness which

seemed to carry evidence of truth. The physical examination showed the genitals well developed, but no more so than was proper at his age. There was absolutely no scar on the penis, none in the groin, no enlarged glands at any point; nor could I find any other evidence of syphilitic infection.

14th. Up to the 12th inst. he had been steadily gaining. He was able to turn over in bed promptly and with ease, the turning to the left being not so easy as that to the right, on account of the weakness of the right leg; freedom of the movements of the arm had increased. His appetite has been almost voracious. On the 12th, possibly due to the indiscretion in diet, he vomited all day, and both yesterday and today he has been more or less listless and miserable; his pulse, however, has not gone above 72; his tongue is coated; bowels constipated. On lifting his head by the hand under the occiput, the post-cervical muscles are very tense, and he still complains of pain, but locates it at the mid-sternum and not at the ensiform cartilage; this pain does not appear when he attempts to flex his head voluntarily. There is moderate ptosis, but he can lift the upper lid voluntarily without elevation of the eyebrows. The pupils are both slightly smaller than before, especially the right one, and both respond feebly to light; the eyeballs can be freely moved in all directions.

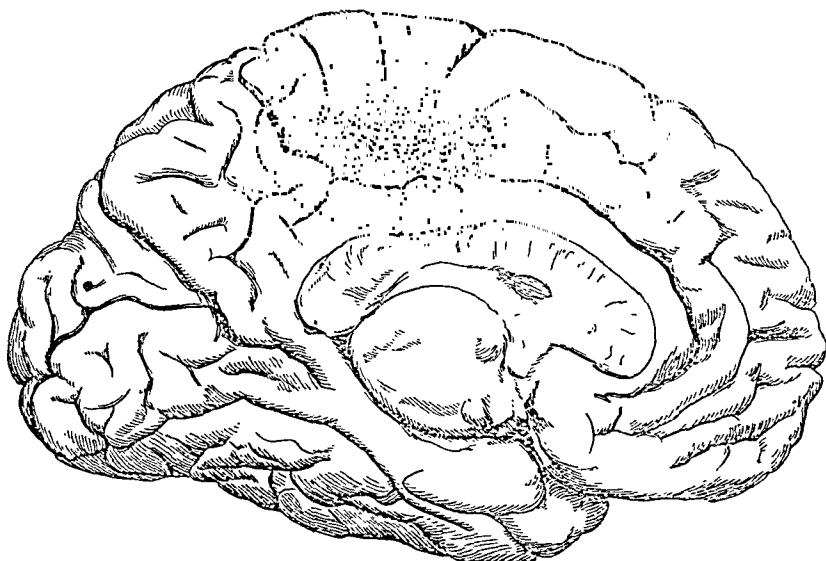
November 18th. His pulse of late has been but forty or fifty to the minute; he became more stupid, and died this morning at four o'clock.

Post-mortem, November 19th, 12 M., thirty-two hours after death. Nothing abnormal was observed about the scalp or on the exterior of the skull. When removed, the skull-cap was extremely thin; it was transparent in a great many places, and over the longitudinal sinus posteriorly was almost perforated by a Pacchionian body. There was no meningitis; the veins were moderately full. The brain substance in the motor area looked entirely normal, but it was evidently soft and flabby over a large area.

Dr. W. J. Taylor, who made the post-mortem, passed his finger into the median fissure, without observing anything abnormal; but when the two hemispheres were separated in the left there was a mass, blackish in color, occupying the space midway between the corpus callosum and the upper surface of the brain, in a position corresponding to the paracentral lobule, and pushing downward the calloso-marginal fissure. It measured one and three-quarter inches antero-posteriorly, and one inch vertically. By the time the brain was removed from the head and placed in a basin, a tumor, of which this mass was the edge, had been spontaneously and almost entirely enucleated from the left hemisphere by the disturbance caused by the manipulations. When removed, it measured three and three-quarter inches by two and three-quarter inches, the long axis being transverse. (Figs. 3 and 4.) It occupied a position directly under the motor area; the cortex of the motor area, which lay over it, was one-third of an inch in thickness, and to the eye entirely normal. The walls of the cavity in which the tumor lay were lined with a thin layer of brownish, semi-fluid substance. No large vessels penetrated it excepting at the protruding mass next the falx, where two very large veins lay on its surface. Whether the tumor had protruded into the lateral ventricle during life, it is difficult to say. When the tumor had escaped from its cavity, this latter was seen to communicate with the lateral ventricle; but this might readily have been from a tear in handling

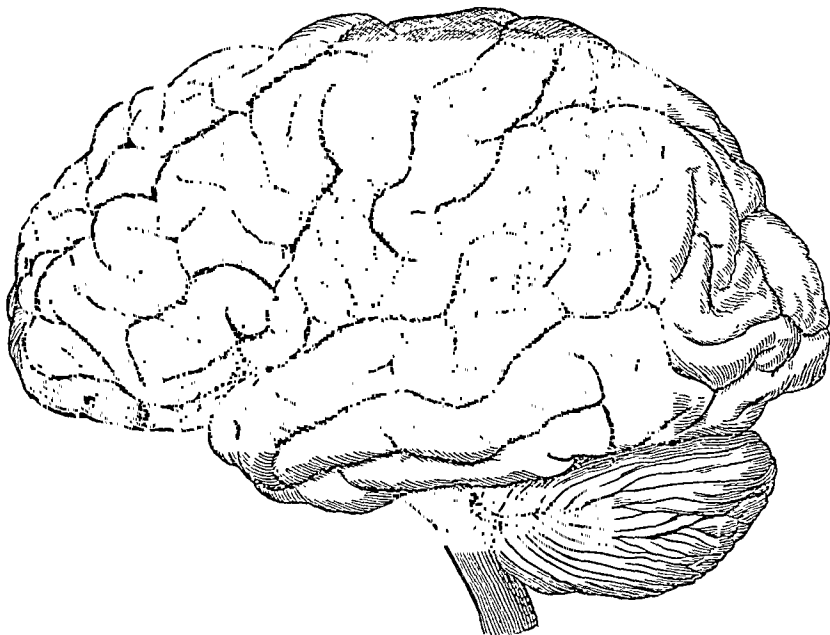
the brain, as it was very soft in all the region bordering on the tumor for an inch or more. Both ventricles were moderately dilated; and

FIG. 3.



Inner surface of brain, showing site of tumor, its centre being softened and blackish in the darker area.

FIG. 4.



External surface of the brain, showing the site of the tumor which lay under the cortex

filled with the cerebro-spinal fluid, which had in it few, if any, flakes or other evidences of disease. In the spinal canal, while removing the brain, about an ounce of fluid appeared to be present; the cord appeared to be

normal. On turning the brain upside down, the floor of the third ventricle was extremely thin, and the corpora quadrigemina tore apart with great ease.

Description of the tumor. Its size is stated above. It consisted of a mass of about the consistence of normal brain tissue. Its upper extremity, where it protruded through the hemisphere on its median aspect, was of a blackish color—as also was one other spot as large as a cherry—this color being due to hemorrhages which had taken place in the interior of the tumor. The opposite extremity of it was quite œdematous. The whole tumor was nodulated. Its weight was four and one-half ounces.

Prof. W. M. L. Coplin examined the tumor microscopically, and reported as follows :

“The tumor itself is made up of sarcomatous elements differing but slightly from what is recognized as glioma. The condition of the brain substance is very interesting. The perivascular lymph channels are more or less occluded, and the nutrient vessels no longer patulous, but surrounded by areas undergoing degenerative processes. There was no infiltration of the walls of the cavity in which the tumor lay.”

REMARKS BY DR. LEWIS.

The tumor, as found at the autopsy, did not occupy exactly the position where it was thought probably to be situated. The pressure on the optic tract and other signs of interference at the base of the brain led to the belief that the growth was situated deep in the left mid-brain, and in consequence of this belief it was advised that no operation be performed. Had the patient been operated on and the trephine placed over the motor area upon the left side it is doubtful in my mind whether the tumor would have been recognized, and even if an incision had revealed its presence it is difficult to see how a mass measuring two and three-quarter by three and three-quarter inches, situated one-third of an inch beneath the cortex, could have been removed without destroying all, or most, of the overlying motor cortex. It is also difficult to suppose that the mass could have been removed by way of the longitudinal fissure at the point where it approached most closely to the median line of the left hemisphere.

REMARKS BY DR. KEEN.

A number of points in connection with this case are instructive. The cause of the tumor was very probably the fall of twenty feet. It is almost certain from the marked unconsciousness following the accident that he struck his head, and as the post-mortem showed that his skull was very thin it is possible that this traumatism may have been more serious than to a person with a skull of usual thickness. On the other hand, it is equally possible that the thinning of the skull may have been produced later by the tumor. However this is, the lesson to be learned from the

case is not to forget that such trauma may be followed by a tumor such as a fibroma, as in a case which I reported some years since (*AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, September, 1888),¹ or sarcoma, as in this case.

The long time which elapsed after the fall before the brain trouble began is also a caution to us not to forget the remoter effects of such injuries. Even much longer periods than this have elapsed in cases of abscess, and the present case shows that we ought to remember such possibilities in all instances of traumatism. Moreover, had this been borne in mind the error of diagnosis as to the beginning trouble with his leg, for which a brace was ordered, would have been avoided.

We debated very seriously the question as to whether the tumor was a sarcoma arising from the traumatism, or a tubercular tumor or tumors, or possibly a syphilitic gumma. The latter, both from the history and therapeutic tests, was rejected, and the question lay between tubercle and sarcoma. The early involvement of all the various centres on one side, such as leg, arm, and face, convinced us that the tumor was either multiple or else was very extensive, and this, as well as the supposed position of the tumor, deterred us from any operative procedure, especially as his condition, when I first saw him, was such that we judged his life would not be long, and the effect in case of operation was not hopeful. Had we trephined we should have come down upon normal brain tissue. The tumor lay one-third of an inch below the cortex, was nearly of the consistence of the cortex, and would scarcely have been discovered by puncture. Reflecting upon this and some other similar cases, I have thought that we might sometimes use to advantage in the brain the procedure we constantly employ elsewhere, viz.: Make an incision, one to two inches long, and, say an inch deep, and draw asunder the edges of the opening in order to see whether there is anything abnormal beneath the cortex. I have never yet done so, but shall certainly try it in the first case suitable for such a manœuvre. Had we been able to reach it, through a large opening, it is doubtful whether its enucleation would have been a feasible step, in spite of the brown semi-fluid débris which prevented any connection between the tumor and the surrounding parts—so that at the post-mortem it dropped from its cavity like an egg from its shell. Prof. Coplin especially examined the question of infiltration of the neighboring brain tissue, which constituted the wall of the cavity in which lay the tumor, and was satisfied that there was none. This, of course, is rare in sarcoma, but should not be forgotten in other cases, as it would influence our determination to attempt a removal.

¹ This patient is still alive, with somewhat better sight and very infrequent epileptic attacks. He has gone as long as a year without any.

The variations in the degree of paresis in the arm and leg, *inter se*, and of the arm at various times, and the variations in the strabismus and sight are all extremely interesting and instructive.

Ferrier has already pointed out that pain on percussion over the site of a tumor is of more value as a means of locating such a lesion than spontaneous pain. Although in this patient this varied to some extent, yet, as a rule, pain on percussion was much more noticable over the site of the tumor than spontaneous pain.

A curious fact which Dr. Lewis tells me he has observed in another case of cerebral tumor, and which Dr. Thomas G. Morton has also observed in other cases, is the pain either at the ensiform or at the mid-sternum, particularly upon flexing the head. How to explain this I do not know. It may prove hereafter to be a sign of some value.

(To be continued.)

ON SOME UNUSUAL NEW GROWTHS OF THE VULVA.

BY R. W. TAYLOR, M.D.,

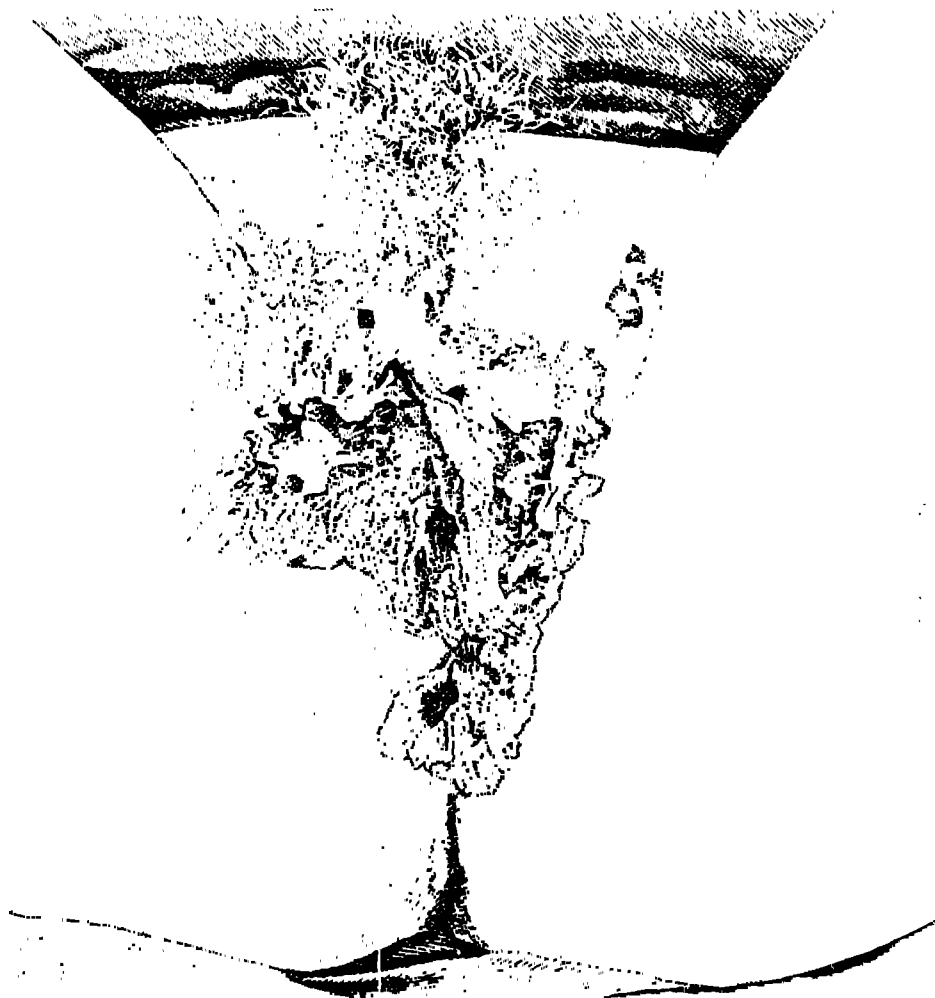
CLINICAL PROFESSOR OF VENEREAL DISEASES AT THE COLLEGE OF PHYSICIANS AND SURGEONS,
NEW YORK; SURGEON TO BELLEVUE HOSPITAL.

UNDER the title "A Hitherto Undescribed Form of New Growth of the Vulva" I published an essay in the issue for February, 1890, of this journal, in which I reported at length one case and briefly alluded to a second. In the present paper I report two further cases, and in order to bring out their features and phenomena conspicuously I reproduce a portion of my published description of the first case. It will be seen that my second case is clinically and microscopically similar to the first one, but that the third case differs strikingly and radically in its objective phenomena and clinical history from the first two cases. To reconcile this seemingly unscientific classification I may say that while my clinical studies convinced me that Cases I. and II. were remarkable examples of an unusual and until 1890 undescribed form of new growth of the vulva, the microscopist tries to teach me much against my will that in Case III. the pathological process is precisely similar to that presented by Cases I. and II. Seeing that it is impossible with this limited number of cases to draw absolute conclusions or to venture upon generalization, I simply report the cases in such a manner as to bring out their salient features, adding such comment as my study and observation have led me to.

CASE I.—S. L., a female domestic of loose habits had suffered from chancroids and suppurating buboes, which were treated by me over a number of years, but no history of syphilis could be obtained, even

after most careful questioning on many occasions and after thorough examinations of her body. Subsequent to her thirty-fifth year she had suffered from vulvitis, which she had ascribed to her former chancroids. Intemperance and carelessness of person undoubtedly were largely contributing causes. When she was forty-five years old she again entered Charity Hospital, in fairly good general health, and remained under my observation until her death, which occurred nearly three years later. We found the vulva the seat of a maroon-colored flat new growth which extended to the pubes and right inguinal region and encircled the anus.

FIG. 1.



Showing the new growth in period of full development.

The appearances of this peculiar new growth are well shown in Fig. 1, which was made about two and a half years after the date of its beginning. It will be seen that the normal appearances of the vulva are wholly lost. There are no traces of the labia, large or small. The clitoris is represented by a central mass of cicatricial tissue, and the introitus vaginae looks like a ragged slit. The perineum is also invaded

with processes of the new growth jutting backward. Extending from the vulva the disease is seen to invade the pubes and the right groin, and to extend downward over the skin of the fork of the thighs. In no place is there evidence of tumor-like formation, as the new growth is everywhere developed *en surface*; in other words, it is flat in structure. The surface of this neoplasm is of a maroon or chocolate color, with considerable glossiness. At times this morbid surface was perfectly dry, and at others it gave issue to a thin, scanty, reddish serum.

The parts present a firm but decidedly elastic feeling, as if the new growth possessed a fair amount of density. To the eye and to the finger-tip it is evident that the vulvar and extra-genital portion of the new growth is uneven and thrown into slight irregular folds, a condition due undoubtedly to the natural conformation of the parts. Radiating from the clitoris region is a quite well formed sheet of cicatricial tissue, and scattered on the outer and upper parts of the new growth are irregular shaped islets of the same. Upon the lower part of the vulva and toward the perineum the mode of extension of the new growth is well shown. On the right side it juts outward by an abrupt semicircular elevated margin, while on the left the morbid tissue ends in a similarly sharp festooned outline. In the upper and older parts of the morbid area the sharpness of the margination is lost in cicatricial tissue, and elsewhere as a result of treatment adopted. At the time this drawing was made the morbid process stopped at the orifice of the vagina, which, however, was somewhat contracted. Toward the end of life the new growth became so copious and firm in this region that this orifice would only admit, and then with considerable pain, a soft bougie of about No. 26, French scale. There was never any evidence of stricture of the urethra, but in another case the lumen of that canal was much contracted. Besides the foregoing appearances, there was evidence in life of a marked condensation and contraction in all of the affected parts, which increased very slowly and imperceptibly. The salience of the vulva was, in the end, wholly lost, and examination of the new growth *en masse* showed that it was quite firmly adherent to the deeper parts. When the patient was on her back the genitalia had a peculiar, flat appearance, and as she stood up it was evident that the labia majora no longer protruded between the thighs.

This new growth began as a thickened, slightly elevated patch, of deep-red color, upon the left small and large labia. From this region it extended by peripheral increase toward the vaginal orifice, over the clitoris and upward and downward on the right side, while on the left it jutted down to near the anal orifice. The increase in area took place slowly, and as the new morbid tissue was formed, the older portions remained without any visible change, ulcerative or reparative. A slight amount of heat, pain, and pruritus was felt at irregular periods. The local symptoms, however, were for a long time so mild in character that the patient made little complaint. She could sit, walk, move, and lie down with little discomfort. Later on this was all changed.

As the new growth extended it seemed to involve and infiltrate the whole thickness of the mucous membrane and the connective structures beneath them, and to convert them into a firm, elastic tissue.

This form of new growth, it seems, is not peculiar to mucous membranes. By its peripheral increase it involves the skin, as is well shown in Fig. 1, and its progress on this tissue may be accurately

studied. We find on the integument the same flat form of new growth seen on the mucous membranes. The surface is smooth, even, and glossy, and the color a decided maroon. The elevation of the patches is from one to three lines, and they end by a well-defined curved or festooned border, which, rounding off sharply, is lost in the sound skin.

The elasticity of the infiltration remained for indefinite periods, and was slowly and gradually replaced by a marked condition of condensation, particularly in the central vulvar region. The result was that the conformation of the genitals was more and more destroyed.

As the new growth infiltrates the tissues it is noticed that, as condensation takes place, the morbid areas become more or less attached to the bony or aponeurotic parts beneath, until, in the end, they may feel as if soldered to them. The foregoing conditions were frequently observed. Along the vulvar sulcus, where the disease originally began, the tissues presented to the finger-tip an almost brawny sensation, whereas, at the periphery of the new growth, well-marked but still decidedly firm elasticity was noted.

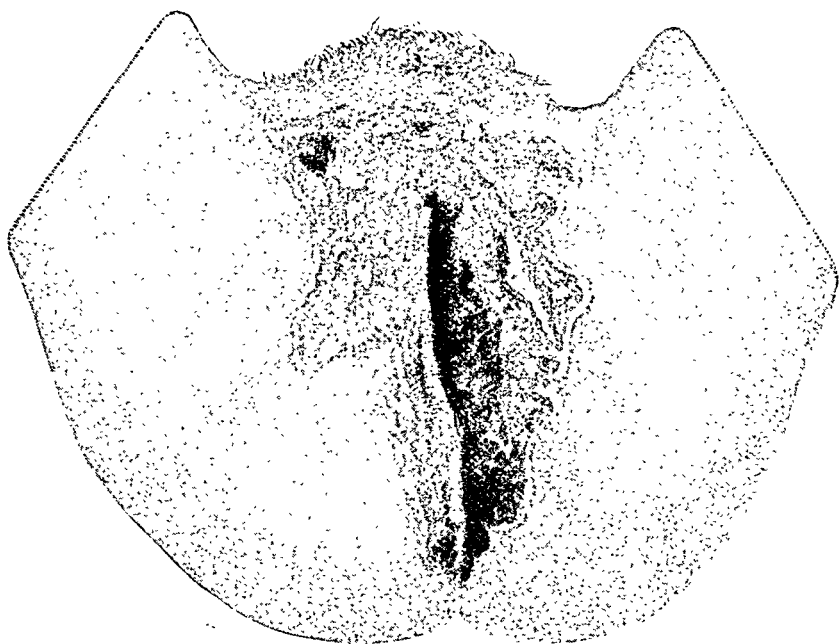
Let us now study the superficial appearances of this new growth during its entire course. As I have said before, the surface of the morbid parts was always rather glossy, sometimes dry and again slightly moist, always, however, presenting a delicately raw appearance. On the mons Veneris and the thighs evidences of healing were very often noted. This process usually began in spots of pearly cicatrization, which increased under favorable circumstances, until sometimes large healed areas were produced. But the cicatricial tissue always showed a great lack of vitality and endurance. So long as great care was observed, and the parts were kept scrupulously clean and dry, the healed surfaces might remain intact. But any inattention (from indifference of the nurse, or during the menstrual epoch, or a drunken debauch) was inevitably followed by retrogression. It was surprising to see how rapidly the cicatricial tissue melted away. A part which was pretty well healed one day might a day or two later present the most typical morbid appearance. It was always evident that in healing, though the superficies of the morbid tissue became cicatrized, the deeper parts remain unaltered. Thus the disease oscillated between a cicatrized condition and the reverse month after month, in spite of the most careful treatment.

The tendency to healing, however, was only observed in the juxtaposed genital parts just mentioned. At no time could we produce reparative changes on and within the vulva proper. There the secretions and the close coaptation of the parts wholly prevented cicatrization, even though the greatest care was used in placing interposing absorbent dressings. As time went on, the condensation of the vulvar and vaginal tissues was so great that the vulva was converted into a raw slit of tough tissue, the lips of which were drawn more and more tightly together and the vaginal orifice almost completely stenosed. This state is well shown in Fig. 2, which was taken about three months before death. It is interesting to study this picture in connection with Fig. 1. It will be seen that in rather more than two years the disease has extended somewhat in an outward and backward direction. It is evident, however, that the luxuriance of the infiltration shows itself by involving the tissues in their whole thickness and depth, rather than by peripheral extension. This same feature (as well as all others) was observed in a case seen by me about ten years ago, the history of which was unfortu-

nately lost. The new growth showed a tendency to remain localized to the vulvar and juxta-vulvar regions.

During its whole course this new growth showed no tendency to luxuriate upon the surface. There was never any evidence of tumor-like formation, since the infiltration never reached a greater height than three lines. There is never any evidence whatever of ulceration, and though the morbid growth may in more or less degree become less salient, the decrease in its height is due to the slow and almost imperceptible melting away of its superficies and to its inherent slow contractile tendency. Further than this, it was observed that in the recesses of the vulva, where the lesion was thrown into anfractuosités, there was not the slightest ulceration between its clefts and folds. It never presented any appearance resembling papillomatous outgrowths.

FIG. 2.



Showing the condition of the genitals three months before death.

Though this inflammatory and infiltrative process lasted many years, it did not seem to involve the contiguous lymphatic system. In both of my early cases and in the second reported in this essay the ganglia were slightly, if at all, larger than normal, but in none of them was there at any time any evidence of inflammation. There was an entire absence of erythematous and erysipelatous complications.

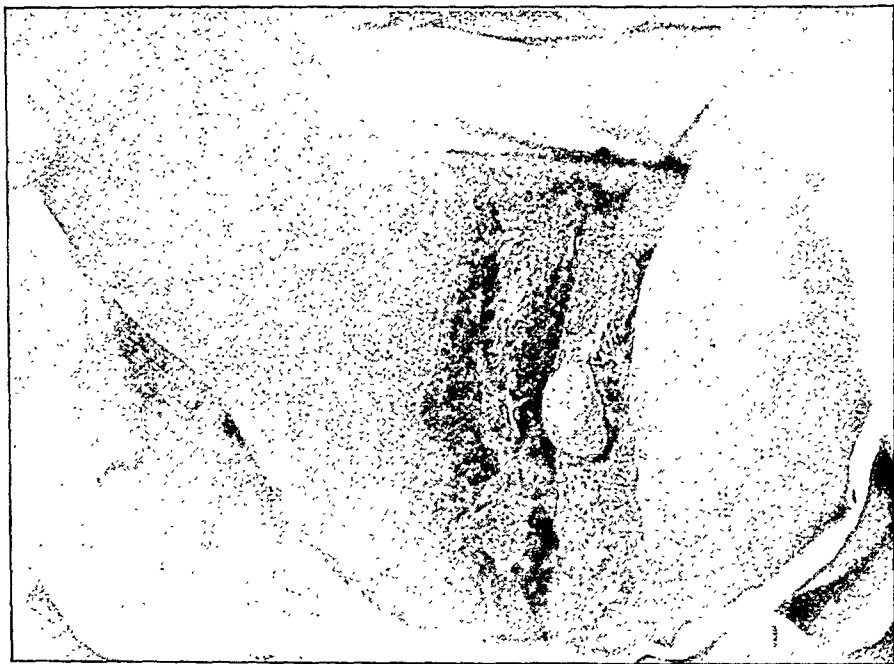
The disease shows no tendency whatever to malignant degeneration, and of itself seems to have no direct influence upon the general economy.

As I have already stated, the local symptoms were for a long time mild in character, and the patient made little complaint. Gradually, however, as the disease progressed without any abatement, the soreness in the parts was replaced by pain, particularly on the slightest movement. Walking became almost impossible, the erect position of the body could only be maintained with the greatest difficulty and discom-

fort, and as sitting became painful and almost impossible, the patient was forced to take to her bed. Even in the recumbent position all movements caused uneasiness and pain. The swollen, contracted, and excoriated condition of the vulvar sulcus impeded urination; the stenosis of the vaginal orifice prevented the use of cleansing and soothing injections and impeded menstruation, while the rigidity and irritated condition of the parts prevented the application of absorbent tampons. In this hopeless, bedridden condition, the patient was a pitiable object. Her sufferings and worryment of mind led to utter demoralization, hopelessness, marasmus, and death. The same sad fate overtook the case already alluded to, whose history was lost.

CASE II.—A widow, aged twenty-five years, of remarkably healthy parentage, came to Charity Hospital in January, 1891. She was well developed and tolerably strong, and measles in early infancy was the only sickness she could remember. When twenty-two years old she was married to a sailor, who seemed to her to be a perfectly healthy man.

FIG. 3.



Showing the new growth in its active stage.

In the second year of her marriage (fully four months after the accidental death of her husband) she noticed a small pimple in the right inguinal fold at about the centre. This pimple gave her no pain and discharged no pus. In three months it had increased and formed a circular patch one and a half inches in diameter, with an exulcerated surface, and raised about an eighth of an inch above the normal plane of the skin. This new growth steadily increased in size, running down on the outside of the right labium majus, and involving it and the corresponding nympha, then gradually it extended downward and backward, encircling and involving the anus well in toward the sphincter.

From this region it ran up the outer side of the left labium majus, attacking and destroying, or better melting away, part of it and then the whole of the corresponding nymphæ and ending at the left inguinal fold. The appearance of the parts is very clearly shown in Fig. 3. The new growth was sharply margined by an elevated border nearly a quarter of an inch in height, beyond which the skin was somewhat pigmented, but seemingly healthy. The surface of the new growth was purplish-red in its oldest parts and at the periphery, and of a dull pinkish-red in its centre. The vulva was a raw oozing slit, but it would admit with little uneasiness the first joint of the index finger. The anus was wholly involved, its tissues much condensed, and it was raw, sore, and painful on defecation. The surface of this new growth (which I recognized in an instant, was similar in its nature and character to that of Case I.) was rather more uneven and more mammillated than in the previous case. It varied considerably, however, since sometimes it was smooth and sloping, and then again it would become less even. It gave issue to a scanty serous and sero-sanguinolent discharge. In its early months this new growth was the seat of an ephemeral throbbing pain, but in general, though it caused some discomfort and uneasiness on urination and defecation, it could not be said to be painful.

This patient was a sensible, truthful, virtuous woman, and I am confident that the information she gave us was as near the truth as she could give it. I tried many times in vain to elicit facts pointing to a syphilitic origin of this new growth. She never had any vulvar lesion, nor had she had any vaginal discharge. Repeated careful examination of her body failed to arouse any trace or suspicion of syphilis. On the inside of the right thigh were some irregular brownish spots of pigmentation, which I think were due to varicosity of the veins, which was then well marked.

Early in her hospital days we gave this woman a thorough and vigorous anti-syphilitic course of treatment as a tentative measure. She bore the medication very well, but her vulvar lesion remained unaffected. We tried all sorts of local applications, antiseptic, astringent, and stimulating, without much success. We observed signs of improvement, and then came relapse. In this way about ten months slipped by, then, as a last resort, mercurial ointment was applied to the surface, and healing slowly but surely began. In two or three months the parts were fully cicatrized, but the introitus vaginæ was lessened in diameter, and the anus was rather rigid and less distensible than normal.

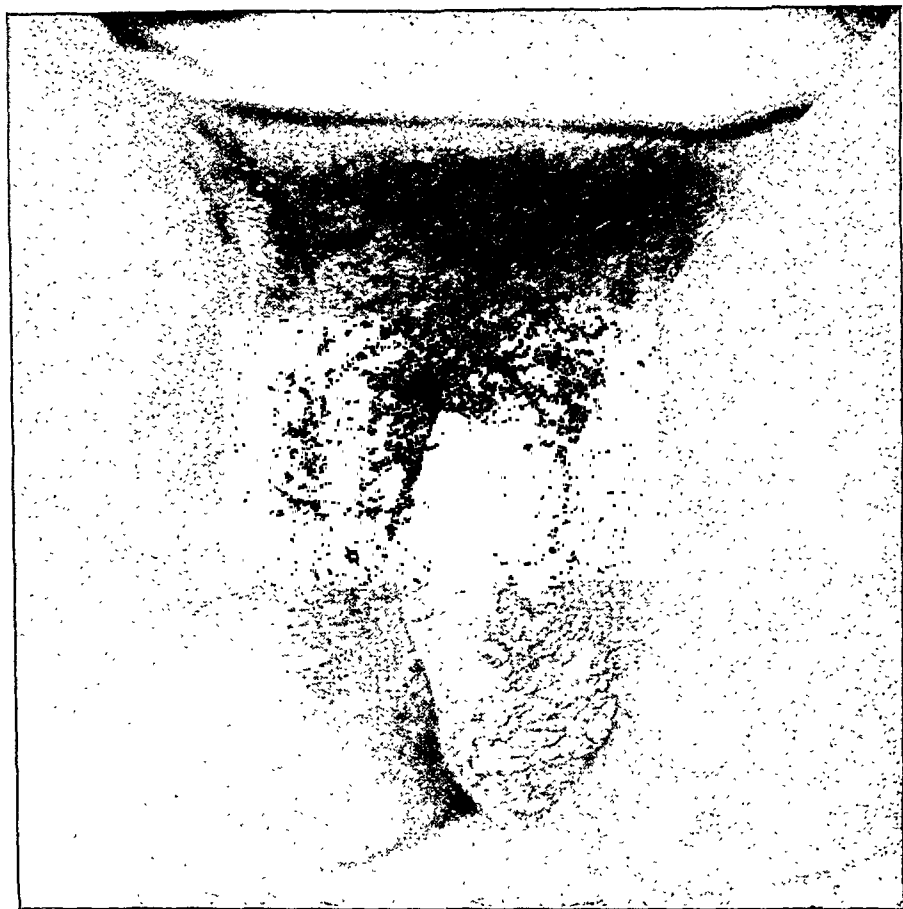
I am disposed to think that the auspicious outcome of this case was largely due to the woman's good condition, her previously regular life and habits, and to her youth. In her we had a healthy condition of the system to aid us in our therapeutics, while in the first case the patient was a woman given for long years to debauchery and all excesses.

I am strongly of the opinion that the early application in this case of hot antiseptic and astringent douches, the careful aseptic condition which the parts were kept in, and the stimulating applications, had much to do toward a cure, and that these medications paved the way for the healing process by means of the mercurial ointment. The fact that healing occurred by this agent warrants the suspicion that perhaps the affection

was syphilitic in its origin, but then we must remember that many simple non-specific infiltrations and thickenings are dissipated by local mercurial action. In other words, we are not warranted in assuming that the cure or the dissipation of lesions by mercurial action is the touchstone of diagnosis. Perhaps the woman had syphilis. I certainly cannot say so, nor have I ever seen such a new growth caused by syphilis. Still, that infection is infinite in its manifestations.

CASE III.—L. S., colored, aged twenty-two years, was admitted to Charity Hospital in March, 1891. In early life she had suffered from

FIG. 4.



Showing the cauliflower appearance on the surface of the tumor.

measles and mumps, but had no other sickness until puberty. It was utterly impossible, owing to the patient's ignorance and bad memory, to get a satisfactory history of syphilitic infection. There were scattered over the body certain small maculations which were deeper in tint than her café-au-lait colored skin, which gave rise to the suspicion that they were the sequelæ of a previous papular eruption, but her story concerning them was very vague. She had, however, well-marked mucous patches

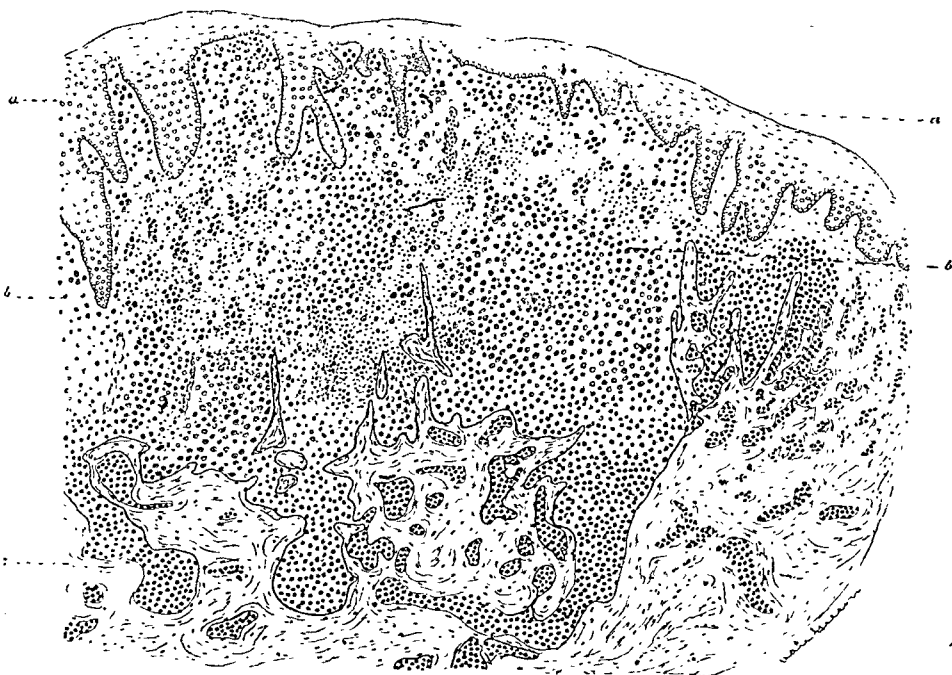
on the fauces, and she suffered from nocturnal rheumatoid pains. These lesions and symptoms, taken in combination with generalized adenopathies, convinced me that she was suffering from syphilis of probably two years' duration. She entered the hospital for vulvar tumor and ulcerations, which are well shown in Fig. 4. According to the patient's account she first noticed the swelling four weeks prior to her entry into the hospital. It is probable, however, that it began rather earlier than at that period. Upon examination it was found that the left labium majus was much hypertrophied in so far that it projected downward for fully two inches, and was correspondingly increased in breadth. The surface of this swelling was irregular, warty, and granular—so much so that several of the hospital staff had diagnosticated it as hypertrophied warts. Firm pressure showed that the mass was of almost cartilaginous hardness and that the morbid process was greatest in the deepest portions of the labium. On the inner surface of the labium were several well-marked chancroids, and there were two or three smaller ulcers on its fellow of the opposite side. The right labium was somewhat oedematous and hyperæmic. In the right groin several ganglia had gone on to suppuration. My diagnosis was indurating oedema of syphilitic origin. The warty appearance of the skin was simply an accident due to irritation in an uncleanly subject. Antiseptic douches were used in the vagina and vulva, and mercurial ointment was freely applied to the vulvar mass. Internal mercurialization was also carefully pushed. This treatment, followed carefully for six weeks, showed no effect whatever on the new growth. I resolved therefore to remove it with the knife. The incisions were made sufficiently deep to remove the mass, and the flaps were so formed that a nearly symmetrical labium was left after the healing, which occupied a month. The woman remained comfortable and well for about fifteen months, when she again entered the hospital. At this time she had a similar and smaller swelling involving the right labium majus, which on its mucous surface presented several large chancroids. This tumor, which like its predecessor, gave rise to no pain, nor much discomfort, was also removed together with a smaller one seated on the lowermost part of the scar of the first tumor. In six months the parts were sufficiently firmly healed to allow the departure of the patient.

Microscopical examinations of these two tumors were made for me by Dr. Van Gieson, who to my utter surprise reported that in structure they presented exactly the same appearances as did the new growths in the two preceding cases.

Microscopical examination and pathology. Portions of the new growths of these three patients were examined in their whole thickness by Dr. Van Gieson, by whom the drawings Figs. 5 and 6 were made. In all these cases the microscopical appearances are thoroughly identical. The tissue was composed of three layers: (1) a superficial layer corresponding to the cutis, which is irregularly thickened by a considerable ingrowth of the Malpighian layer: (2) beneath this, replacing the corium and a portion of the subcutaneous tissue, is a layer of tissue apparently identical with granulation tissue, except that in places it contains large numbers of free red blood-cells; and (3) a third layer corresponding to the deeper subcutaneous tissue, whose lymph spaces are filled and distended with small round and small polyhedral cells (Fig. 6).

Where the nodule became continuous with the surrounding skin the

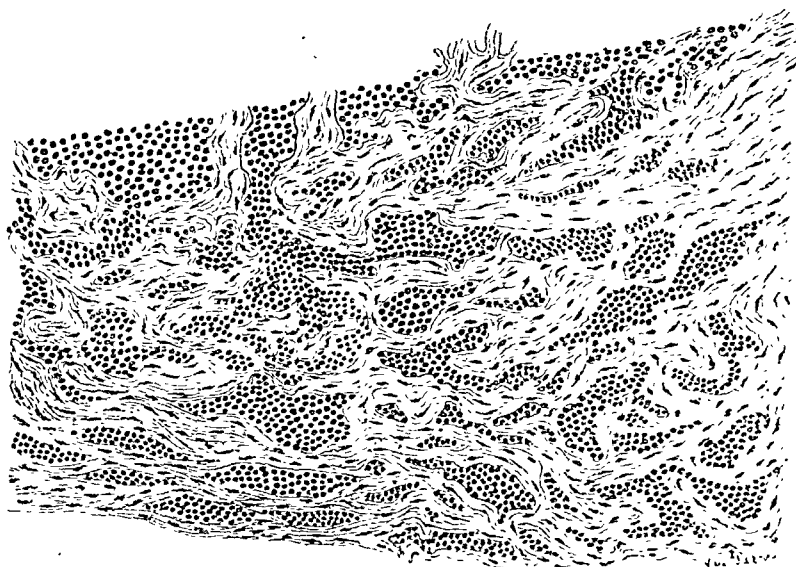
FIG. 5.



Showing a topographical view of the lesion.

a. Epidermis irregularly thickened by ingrowths of the inter-papillary portions of the rete Malpighii. b. Layer of granulation tissue. c. Lymph spaces of the deeper subcutaneous tissue filled with granulation tissue.

FIG. 6.



Showing the distention of the deeper subcutaneous lymph spaces with the granulation tissue.

cutaneous lymph spaces were also filled with small round and polyhedral cells.

There were no bacteria of any kind in any of the numerous sections.

The results of this examination, therefore, seem to warrant the opinion that this chronic lesion consisted of simple inflammatory tissue.

ETIOLOGY.—When I studied the first case over a period of several years, I felt tolerably certain that syphilis was not an underlying cause of the vulvar lesion. In justice to Dr. Van Gieson, I must here state that the microscopical appearances, while showing simply inflammatory tissues, left in his mind a suspicion that perhaps the new growth was of remotely syphilitic origin. To-day, in the light of the developments in the microscopical studies of the third case, which occurred in a syphilitic subject, I also must express my misgivings.

In the second case, which very closely resembled the first, I think I can positively say that a syphilitic origin is out of the question.

The third case is certainly the stumbling-block in this study. In this the lesion is tumor-like and wholly different in its appearance and in its clinical history and course from the other two cases, yet the microscope tells us that its tissue is precisely like that of Cases I. and II. The elder Hebra used to say that when a microscopist was at variance in what he saw with the clinician, the latter was the more certain to be correct in his views, based on observation and study of objective and subjective phenomena. In these cases my studies lead me to think that Cases I. and II. are essentially identical in all particulars, and that Case III. is wholly and almost indisputably different as to its origin, nature, and course, it being a rather unusual instance of syphilitic sclerotic œdema. Yet the microscope tells us they are all similar. I must, therefore, leave the question in doubt, since it can only be settled by the clinical and microscopical study of cases yet to be observed. In the study of these three cases I have done all that I can do, and I shall hope to hear from other observers who may have similar cases.

DIAGNOSIS.—The features of the first two cases might be mistaken for serpiginous chancroid, but close observation shows that the morbid process is essentially a hyperplasia and not ulceration. I know of no classical syphilitic process which resembles it. The diagnosis of lupus may occur to the mind, but this affection is different in its nature and course. So well marked and characteristic are the appearances of this new growth in Cases I. and II. that anyone familiar with it will readily recognize it. The appearances and history of the growth in Case III. are so striking and characteristic that anyone familiar with the vulvar lesions of syphilis will readily recognize it as indurated or sclerotic œdema. It might, however, be mistaken for hypertrophic vegetations, or even epithelioma, but the history and pathological appearances exclude these affections.

TREATMENT.—This has been so well gone over in the consideration of Cases I. and II. that there is little need of further detail. The physician's therapeutical armamentarium will be sorely taxed, and if he is fortunate enough to bring about cicatrization by any means whatever he is to be congratulated.

In dealing with growths such as are shown in Fig. 4, a wide experience has convinced me that it is well to try a vigorous local and general mercurial treatment. This may perhaps bring about resolution of the tumor; but when it fails, as it frequently does, the best procedure is ablation, carefully performed, with a view of leaving the parts as nearly like normal as possible.

40 WEST TWENTY-FIRST ST., NEW YORK.

PROTOZOA AND CARCINOMA.

BY I. ADLER, M.D.,

PROFESSOR OF CLINICAL PATHOLOGY AT THE NEW YORK POLYCLINIC; VISITING PHYSICIAN
AND PATHOLOGIST TO THE GERMAN HOSPITAL, NEW YORK.

ANYONE surveying the literature that has accumulated during the last few years on protozoa and their relations to malignant tumors and especially to carcinoma, will no doubt be struck by the apparently hopeless tangle of contradictory observations and theories. A closer scrutiny, however, discloses certain fundamental lines along which all this mass of research and speculation can be arranged.

For the last three years I have been steadily engaged in a study of cancer with regard to the question of protozoic parasitism and certain other points of its histology. More than sixty carcinomata from various regions of the body have been examined, besides numerous sarcomata and non-malignant growths. The pieces of tumor were in every case taken immediately after removal, and in many instances small pieces of tumor were removed before the operation in order to insure fixation of the tissues in a state approximating as closely as possible to that of actual life. Pieces of each tumor were invariably dropped at once into various fixing solutions, one of these in the last year being always a concentrated bichloride of mercury solution according to Heidenhain or Hanseemann. They were then in the usual manner hardened, imbedded in paraffin or celloidin, cut with a microtome into thin sections varying from 1 to 10 μ , and stained according to numerous methods. Thus thousands of sections were examined and compared. I desire to express here my grateful obligation to Drs. Willy Meyer, Kammerer, Krug, Gerster, and F. Lange, to whose kindness I am indebted for the greater part of this valuable material. I trust to be enabled at not too

distant a date to submit some slight contributions to our knowledge of the more minute histology and pathology of cancer. In the following lines I propose to briefly sketch the present status of the question concerning the relations of protozoa to carcinoma on the basis of a careful consideration of the publications of others and of my own work.

The two fundamental questions that claim our attention are:

1. Has the presence of parasitic protozoa in carcinoma been demonstrated beyond possibility of doubt? and
2. If so, has any etiological relation been established between these parasites and the neoplasm?

The existence of certain pathogenic protozoa is now a sufficiently well established fact. The *plasmodium* (*hæmatophyllum*) *malariae*, the *amœba* of dysentery and certain other forms of enteritis, the *coccidium oviforme* of the rabbit, are well-known instances. All these are, however, easy of recognition. The *amœbæ* can be traced in the dejections whilst still alive, and by their movements and peculiar structure are not readily confounded with any other cells. Once observed during life they can without much difficulty be recognized in the stained and hardened tissues.

Again, *amœbæ* are not intra-cellular parasites, and *coccidium* has so well-marked a cycle of development, and is in the encysted state so conspicuous and characteristic an object, that a mistake in diagnosis is hardly possible. In the *hæmatophyllum malariae* we have indeed an intra-cellular parasite, and for some years the controversy was maintained with much earnestness whether or not it was a true parasitic organism or some form of degeneration of the erythrocyte. The parasites can, however, readily be observed while living and moving within the red blood-corpuscles. There is, moreover, in a certain sense a specific stain, inasmuch as methylene-blue does not stain the blood corpuscles while it does stain the plasmodium. A tolerably well marked developmental cycle has also been demonstrated, thus leaving no possibility of doubt of the protozoan and parasitic character of the plasmodium.

But on what indisputable basis can we establish the diagnosis of protozoan parasites in cancer? We have to deal here with conditions the complexity of which is only just beginning to be recognized. The observation of the living tissues is encompassed by almost insurmountable difficulties, and we are compelled to depend almost exclusively on a study of artificially fixed, hardened, and stained specimens. A comparison of sections of different pieces of the same tumor fixed respectively in Flemming's solution, picric acid, alcohol, and bichloride of mercury will readily demonstrate the widely different appearances resulting from different methods of fixing and hardening. Noeggerath,^{48*}

* The numbers refer to the table of references appended to this paper.

Gibbes,²⁸ and others have already pointed out this source of error, and I would again urge that only such results are comparable as have been obtained by precisely the same methods of preparation.

Besides the artefactions due to the processes of preparation, the cell metamorphoses must also be taken into account. The more closely the subject is studied the more the conviction is forced upon the observer that numerous alterations, regressive as well as progressive, are continually going on in cancerous tissues. A wide field for research is open here, and its investigation has as yet not passed beyond the very first stages. Degenerations of all kinds (hyaline, colloid, gelatinous, horny, etc.), vacuolization and dropsy of the cell bodies, irregularities in the distribution of the chromatin, dispersion of chromosomes and fragments of such during and after the karyokinetic process, asymmetric mitosis, cell invaginations, intra- and inter-cellular invasion of red blood-corpuscles and leucocytes, either normal or variously degenerated—all these and numerous other irregularities must be most carefully studied in this connection.

We must take into consideration also that no specific stain for protozoa has as yet been discovered. It can readily be shown that cells manifestly degenerated, whose derivation from healthy cells is made apparent by a full line of intermediate stages, will stain differently from healthy cells with many, or all, of the usual aniline or hæmatoxylon dyes. Metachromatism, therefore, can by no means be depended on in every case as a safeguard against error.

The bacteriological methods, so marvellously successful with bacterial microbes, have thus far entirely failed in the case of protozoa. In spite of numerous and determined efforts no method of culture has as yet led to any practical results.

How, then, can we arrive at the diagnosis of a protozoan parasite in cancer? The difficulties seem almost insurmountable. No methods of pure culture, no specific stain, hardly a possibility of examining living tissue, and a multitude of cell metamorphoses in the tumor which tend to simulate parasitic cell-enclosure.

According to the present very imperfect knowledge of everything connected with this subject the answer to the question can, in my opinion, be only this:

We are justified in making a diagnosis of a protozoan parasite in cancer only when its morphological attributes and its reaction toward stains are such as to preclude all possibility of being explained by any of the numerous kinds of cell metamorphosis or other irregularities of cell life hinted at above, and when, in addition thereto, a sufficiently well marked and well established developmental cycle can be demonstrated.

If now the work done within the last few years on protozoa in carcinoma be tested by this standard, it becomes apparent that by far the

larger part of what authors have claimed as parasites cannot unconditionally be accepted as such. It will be readily comprehended, too, why so little uniformity of results has been obtained. While some observers find the principal seat of the parasite within the nucleus, others deny the existence of intra-nuclear bodies altogether and locate the protozoön principally in the protoplasmatic cell body or between the cells. A glance at the illustrations furnished by Wickham,⁸² Steinhaus,⁷¹ Foà,²⁵ Podwyssozki and Sawtschenko,⁵⁶ Soudakewitsch,⁷⁰ Sjöbring,⁶⁹ Pfeiffer,⁵⁴ and others will demonstrate what widely differing objects were claimed as parasites, though it cannot be denied that certain typical forms reappear in the work of nearly all of these authors. While certain authors—Albarran,² Malassez,⁴¹ Darier,¹⁷ Wickham,⁸² Ramsay Wright,⁸⁴ Russell,⁶³ etc.—are convinced of the abundant and constant occurrence of protozoa in carcinoma, others, among whom may be mentioned Borrel,⁴ Firket,²⁴ Klebs,³⁵ Ribbert,⁵⁸ Shattock and Ballance,⁶⁷ are inclined to deny their existence altogether, and explain the histological appearances which have been classed as protozoa, as due to some of the numerous cell irregularities which are known to occur in cancer. Particularly Török,⁷⁸ in a very careful study of the subject, has recently pointed out where some of the prominent adherents of the parasitic theory have, in his judgment, been at fault. Still other investigators, such as Steinhaus,⁷¹ Podwyssozki,⁵⁵ Stroebe,⁷⁴ Siegenbeck van Heukelom,⁶⁸ reserve their judgment; and while admitting that much that has been regarded as parasitic is due to some form of cell metamorphosis, still contend that certain cell enclosures which they picture can best be explained on the supposition that they are stages in the development of a protozoan parasite.

As regards my own work on the subject and its results, I hope on a subsequent occasion to give a more detailed account. I wish here to state very briefly that in all the very large mass of material examined, nothing has been observed but what could easily be explained without having recourse to the assumption of protozoan parasites. The majority of the appearances described and portrayed by other investigators were recognized, but in no case could I convince myself of the protozoan character of the objects, according to the principle enunciated above. On the whole I can subscribe to the views expressed by Török.⁷⁸

Within the last few weeks Korotneff's investigations⁴⁰ have appeared. He describes a new parasite, *Rhopalocephalus carcinomatosus*, with all its stages of development, and regards it as specific in cancer. I have as yet not had time to follow his methods and attempt a verification of his statements. The material on which he bases his observations is extremely limited. Nevertheless if competent observers will substantiate his results, it seems probable that here we have a true parasitic protozoön in cancer, fulfilling all the conditions required by our fundamental principle (*cf.* Korotneff's Figs. 1, 2, 15, 19, 21, 46, etc.).

Somewhat similar observations, though attained by different methods, have also been published by Sawtschenko,⁶⁴ and I am inclined to think that here also we have to deal with a true parasite. The observations of Burchardt⁸ may possibly also come under this head.

As a result of the entire discussion it seems safe to say that while the large mass of cell-enclosures and intra-cellular bodies prematurely regarded as protozoa have no claim to this title, it seems highly probable that protozoan parasites can and do occasionally occur in carcinoma.

What relation have protozoa to carcinoma? Is there an etiological connection, and are we justified in the present state of our knowledge in assuming a parasitic origin of cancer?

At this point of the inquiry it becomes important to consider if the investigation of protozoic parasites throughout the animal kingdom has thus far brought to light any tumors due to parasitic action that can be classed as true cancer, or at least as analogous to it.

It would seem that the animalcules in question are in some instances perfectly harmless cell-parasites. It is true, the host-cell is usually destroyed, but there is no injury to the surrounding tissue nor to the organism as a whole. As examples of this may be cited the *Klossia helicina* in the snail-kidney, and the *monocystis* forms in the testicle of lumbricus. In other cases the presence of the parasite causes mechanical and chemical irritation. We must suppose that the *plasmodium malarix* destroys its host-cells, and, tainting the blood with the products of its metabolism, produces the characteristic symptoms of malarial fever.

As an instance of the extra-cellular parasite, the amœbæ of dysentery presumably produce their characteristic symptoms by chemical irritation as a consequence of their peculiar metabolism.

There are, however, certain forms of protozoa which cause distinct proliferation of the surrounding tissue and thus produce well-marked tumors. To Pfeiffer we are indebted for the knowledge of such tumors caused by *micro-* and *myxo-sporidia*; and the tumors caused by the various forms of *coccidia*, particularly by the *coccidium oviforme* of the rabbit, are brought forward again and again as a convincing argument by the unconditional adherents of the parasitic theory of cancer.

Delépine and Cooper²² have very recently shown that the *psorospermiosis* or *gregarinosi*s of the rabbit in very numerous instances causes no morbid symptoms whatsoever, and interferes neither with the life nor the health of the animal, though after death numerous characteristic fibrous nodules can be found disseminated through the liver and intestines. Sometimes, however, and owing to conditions as yet obscure, the coccidial invasion causes morbid symptoms, and among others tumor-like nodules, particularly in the liver. Such tumor-nodules I have carefully examined. I find in accord with most authors on the subject,

besides considerable new-formation of connective tissue, infiltration of leucocytes and broken-down cell material, a slight but distinct though not always constant proliferation of epithelium, principally of the bile-ducts.

Of tumors caused by *micro-* and *myxo-sporidia* I have no experience, but conclude from the descriptions given by Pfeiffer that they do not materially differ in any fundamental point from those caused by *coccidia*.

Are we justified in considering such tumors as analogous to cancer? It is well to call to mind here that cancers should not be considered as a mere proliferation of epithelial cells. If such proliferation were to be considered the distinctive feature, then every acuminate condyloma, every papilloma, every adenoma would have to be classed as carcinoma—tumors in which the epithelial proliferation far surpasses in magnitude anything produced by the comparatively insignificant proliferation due to protozoa. It is necessary continually to keep in mind that the distinctive characteristics of cancer are, not the mere fact of the proliferation of epithelium, but the new-formation of epithelium and stroma* in a typical manner; the power to produce metastatic tumors in distant parts of the body which faithfully and under all circumstances reproduce the structure of the primary tumor, entirely independent of the character of the tissues in which the secondary nodules are seated; and, thirdly, the general cachexia which, according to the investigations of Klemperer³⁶ and of Müller,⁴⁶ may possibly be due to toxic products resulting from the morbid metabolism of the cancerous tissues. With this view of cancer before us we must come to the conclusion that the tumors thus far recognized as undoubtedly due to protozoic influence have nothing in common with true carcinoma, are in no way analogous to it, but present all the characteristics of chronic irritation or inflammation.

Experiment and observation have abundantly proved that ordinary epithelium when floated by the blood or lymph current into a locality foreign to its nature, though it may remain alive for a while, will certainly not proliferate to any extent, and finally will be infallibly destroyed. Not so with cancerous epithelium. We must accept it as a fact to-day that metastatic cancers originate from particles of the primary tumor bodily transported to distant localities where they proliferate and *reproduce the structure of the primary growth* entirely independent of the histological character of the encompassing tissues. It seems difficult to

* I desire to mention incidentally here that it seems probable that the old theory of Thiersch and Boll, according to which the stroma plays a merely passive part in the histogenesis of carcinoma, and the proliferation of epithelium is due, in a great measure, to the disturbance of the vital equilibrium supposed to exist between epithelium and connective tissue, in favor of the former, will need reconsideration. There are good reasons for believing that very active and quite characteristic processes that have their origin in the stroma can be shown to play an important part in the pathology of cancer.

grasp how the chronic irritation or the toxic influence of a parasite can produce, for instance, a rectal cancer. We see here tubule after tubule with cylindrical epithelium cells, basement membrane, typical arrangement of the stroma, and all, though in a state of wild proliferation, still simulating the normal structure. But how can parasitic action explain the fact that a few particles of this rectal tumor, when transported into the lung or the liver, will produce, not a formless jumble of epithelial cells, but the exact fac-simile of the primary tumor—tubules, stroma, and all the other characteristics? We must agree with Councilman¹⁶ that we have here, according to our present lights, an insurmountable barrier to the theory of a parasitic origin of cancer.

Another problem, as it seems to me, entirely inexplicable by the parasitic theory is presented by certain observations comparatively rare, but sufficiently well attested and studied. I refer to those cases of congenital carcinoma in which both parents are free from tumor and remain healthy.

But leaving theoretical considerations aside, do the actually ascertained facts warrant us in assuming a parasitic origin of cancer? According to the principles long ago laid down by Koch, the following would be necessary in order to establish an indubitable etiological connection between parasites and carcinoma: We would have to find a specific and well-marked micro-organism constantly occurring in every case of carcinoma and in such distribution and topographical arrangement as would suffice to explain the anatomical facts. Pure cultures of this micro-organism would have to be obtained outside of the body; and lastly, methods would have to be found by which inoculations with these pure cultures would reproduce typical cancer.

All attempts at obtaining cultures of protozoa from cancer have thus far entirely failed. The innumerable experiments with a view to a reproduction of cancer by inoculation and transplantation have led to no results. The successful transplantations of Hanau, Wehr, Hahn, and Von Bergmann, though most important, cannot be utilized in this connection.

There remains, then, only the question of the occurrence of specific organisms and their characteristic distribution. I have endeavored to show above that no such specific protozoa have as yet been demonstrated, and that, while it is probable that several kinds of protozoa do occur, they are by no means to be found in every cancer nor in any characteristic distribution. In fact the very earliest metastatic invasion of lymphatic glands, where only very few epithelial cells are as yet distributed through the lymphatic tissue, and where, if at all, one would expect a most unmistakable and vigorous crop of parasites, I have invariably found free from anything resembling protozoa. Ruffer, indeed, finds his cancer-bodies not only of constant occurrence in every form of

cancer, but also in characteristic distribution, and lays particular stress on their constant presence at points of most rapid growth. According to our standard laid down above, however, the protozoan nature of these cancer-bodies has by no means as yet been established, and the objections of Vitalis Müller⁴⁷ and others are not disproved. Further investigations will have to clear up these doubts, particularly as some recent very interesting experiments of Power⁵⁷ seem, after all, to point toward a possibly specific character of these bodies.

It is well to note *en passant* that in sarcoma, so totally different from cancer in structure, cell-enclosures hailed as possible parasites have also been described. (Steinhaus,⁷³ Pawlowsky.⁵⁰)

Recognizing in a measure the insufficiency of the cell-enclosures heretofore described as a basis for a parasitic origin of cancer, two works have recently appeared in which a different view of parasitism is taken.

Adamkiewicz¹ boldly asserts that the cancer cells are not epithelial in character, nor derivatives of epithelial cells, but themselves the full-grown parasites, and the small-cell infiltration so well known in the histology of cancer, their youthful stage (zoöspores). These parasites produce a toxin closely related to neurin, which, when properly administered, has a decided curative effect upon cancerous disease. It is needless to criticise this book here. Schimmelbusch, Hansemann, Paltauf, have said all that need be said on the subject. I will only mention that the crucial experiment on which Adamkiewicz bases his entire theory, the effects, histological and pathological, of implantation of small pieces of cancerous tissue into a rabbit's brain, has been carefully repeated by Geissler, who has conclusively shown that Adamkiewicz's results are based upon errors due to incomplete asepsis.

The other work is by L. Pfeiffer,⁵⁴ to whom we are indebted for so much of our knowledge concerning pathogenic protozoa. After a careful survey of protozoic parasitism in the lower animals and various forms of human disease, he treats of cancer as of undoubted parasitic origin, classifying the protozoön in question as *amœbosporidia*. He studies cancer principally in metastatic nodules in muscular tissue, and accepting the cell-enclosures described by Wickham* and others as representing certain forms in the development of his parasite (*dauerform*), he seeks to establish a complete and characteristic developmental cycle.

While paying tribute to the erudition and indefatigable labor and

* Power's experiments on the effect of chronic irritation on the epithelium of the rabbit have again proved that much of what numerous investigators, and especially Wickham, have described as protozoa (*psorosperms*) is nothing more than cell degeneration. Of Paget's disease I have no personal experience, but through the kindness of Dr. Lustgarten I have had the good fortune to examine fresh material from a case of Darier's disease (*psorospermose folliculaire végétante*). I can only verify the statements of Boeck and of Petersen that there is no proof of the existence of the protozoön, and the so-called psorosperms are in all probability degenerated cell-enclosures and cell-invasions.

enthusiasm of the author, it must nevertheless be confessed that his arguments are far from convincing. He, too, assents that at certain stages of their development the parasites cannot be distinguished from the ordinary epithelial cells. At another stage they resemble leucocytes so closely that the usual small-cell infiltration of cancer is unhesitatingly identified with the spores of parasites. The cardinal facts in the histology and histogenesis of carcinoma are in a great measure ignored in the speculative enthusiasm of the new theory. The beautiful photographs with which the book is profusely illustrated are entirely inadequate as convincing proofs of the author's opinions.

In concluding this short review we would sum up as follows :

The existence of parasitic protozoa in cancer is probable, though the greater part of what has hitherto been described as parasitic is certainly not so. No constant or in any way specific organism has as yet been demonstrated beyond possibilities of doubt. At present no facts, histological or otherwise, compel the assumption of a parasitic origin of carcinoma, while there are very strong and valid arguments against such assumption.

For many years to come the indefatigable efforts of numerous investigators will be required to throw light on this most obscure of diseases. A more intimate penetration into the mysteries of cell structure and cell life, both in health and in disease; a closer study of the living tumor tissues; an endeavor to clear up the, as yet, entirely obscure chemistry of neoplasms—on these lines, no doubt, advances in our knowledge will be made. Nor should the further study of protozoa be neglected, but it should always be allied with coolest criticism and never leave the *terra firma* of experiment and fact for the airy region of wild theorizing and speculation.

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REVIEWS.

ANATOMY, DESCRIPTIVE AND SURGICAL. By HENRY GRAY, F.R.S., Fellow of the Royal College of Surgeons; Lecturer on Anatomy at St. George's Hospital Medical School. Edited by T. PICKERING PICK, Surgeon to and Lecturer on Surgery at St. George's Hospital, etc. A new American from the thirteenth English edition. Pp. 1129, with 636 illustrations, many of which are colored. Philadelphia: Lea Brothers & Co., 1893.

GRAY'S ANATOMY is too well known to require any introduction. It has been for years the standard text-book on anatomy in most if not all of the medical colleges of this country, as evidenced by the fact that it would be difficult to find any practitioner's library which does not contain at least one copy of *Gray*. Every few years a new edition of this work appears, and now we have the very latest of all—"a new American from the thirteenth English edition."

To criticise this book in any way as regards its make-up would be superfluous. The edition bound in leather with colored illustrations is exceedingly handsome, and as a single volume on general and descriptive anatomy is ahead of all competitors in the strength of its binding, quality of paper, and clearness of type and illustrations. But, of course, however important these things may be, they are but accessories to the subject-matter, of which there is such a large amount that its proper consideration is best obtained, not by taking it up as a whole, but by separate comments on each of the main sections as marked out in the book itself. Before such comment is made, however, it will be well to state that no exhaustive criticism is intended or required. The reputation of *Gray's Anatomy* is already established, and the general excellence of its diction as well as its general accuracy of statement are unquestioned, as they have been for years and will doubtless continue to remain.

GENERAL ANATOMY.—This section is essentially the same as in the preceding American edition. Some desirable additions, however, have been made, viz., two illustrations (Figs. 86 and 99) and an excellent description of the process of karyokinesis in the animal cell, accompanied by an illustration (Fig. 6). But there should be noted under development, failure to mention the probable hypoblastic origin of the cells lining the cavities of the heart (His).

OSTEOLOGY.—This has always been one of the best portions of the book and still maintains its high standard in the present edition. The only unfavorable criticism to be made is that in speaking of the lower end of the humerus, the old term *condyle* is retained to designate what is now almost universally called *epicondyle*.

THE ARTICULATIONS.—In the main there is but little departure from former editions. The principal change is the addition of surgical

anatomy to each joint, as well as a description of its surface form. These additions are of decided advantage, as are also those made in describing the shoulder-joint, viz.: the recognition of the transverse humeral ligament and of the supplemental bands of the capsular ligament, notably that of Schlemm.

The tarsal articulations also have received a new and much clearer description.

MUSCLES AND FASCIÆ.—The general arrangement is but little altered. Special commendation must be given to the new illustrations taken from preparations in the Museum of the Royal College of Surgeons, London. With one exception they are all excellent, and add greatly to the value of the text. The exception is Fig. 270, showing the tensor tarsi, which is very obscure, giving no clear idea of the actual arrangement.

The muscles of the perineum have been placed, and very properly so, under *muscles of the trunk*. The intrinsic muscles of the tongue have received an enlarged and greatly improved description. Under the *diaphragm* the external and internal arcuate ligaments are correctly described; this has not been the case in former editions. The same may be said of the supinator brevis muscle. The extensores primi and secundi internodii pollicis have received respectively their less cumbersome modern names—*extensor brevis* and *extensor longus pollicis*. The above comprise all the changes of note, except in the hand and foot, where certain muscles have also received their modern nomenclature, viz.: the deep portion of the flexor brevis pollicis is called *adductor obliquus pollicis*, the adductor pollicis thereby becoming the *adductor transversus pollicis*; while in the foot the same names have been given respectively to what were formerly the adductor pollicis and transversus pedis, with the substitution of “hallucis” for “pollicis.” Hallucis, by the way, should be hallūcis, genitive of hallex or allex. This is an error not confined to Gray, but common to most of the anatomies.

ARTERIES, VEINS, AND LYMPHATICS.—Few changes have been made, but they are of importance in the line of improvement and in accord with the modern views. Thus the old description of the arch of the aorta is done away with, and we have the *ascending aorta*, the *transverse aorta*, and the *descending aorta*. The limits of the first two correspond to those of the “ascending and transverse portions,” respectively, of the “arch of the aorta,” while the last, commencing at the upper limit of the “descending portion” of the arch, continues on down, and is divided into the *thoracic* and *abdominal aorta*. Other changes are: The “temporal” artery is called the *superficial temporal*; the cerebral arteries have received a new and clearer description; the relations of the superficial palmar arch are brought out more prominently; likewise the distinction between the common and superficial femoral; the errors in describing the peroneal artery have been corrected.

Under *veins*, the basilic vein should have been described as being continuous with the axillary vein at the lower border of the tendon of the latissimus dorsi and teres major muscles.

THE NERVOUS SYSTEM.—Under this section the brain and spinal cord have never been particularly well described; it is, therefore, all the more satisfactory to note that a great deal of the matter devoted to these subjects has been practically rewritten and thereby greatly improved. The new description of the medulla is especially to be commended, as is

also that of the floor of the *body* of the lateral ventricles. The floor of the fourth ventricle, however, still retains its old and inaccurate description.

The nerves have always, on the whole, been well described. A few advantageous changes, however, have been made, which give a more accurate description of the superficial petrosal nerve as well as of the lumbar plexus and inferior gluteal nerve. A number of new and good illustrations are introduced.

THE ORGANS OF SENSE.—The tongue, nose, eye, and ear have each the same description as formerly given. A few new and good illustrations have been inserted. No alterations in the text of the first three were necessary. That of the ear, however, should have received a change in the following particular: The “internal ear” should have been distinctly stated to be made up of the bony and membranous labyrinths, and the *scala media* and organ of Corti should have been described as parts of the latter division.

THE ORGANS OF DIGESTION.—The description of each individual part and organ contained in this section is accurate and clear in all respects with the exception of that of the liver and peritoneum, which ought, in a book of this importance, to be free from the errors presently to be pointed out, especially as great improvement has been made over former editions, both generally and particularly in regard to the pancreas and spleen. The errors referred to are:

As to the peritoneum: The lesser omentum is mentioned as attached above only to the transverse fissure of the liver. This is really but a portion of its superior attachment, the remainder, of course, being along the fissure of the ductus venosus. The lateral ligaments of the liver are stated to consist of two layers of peritoneum, the upper from the greater sac, the lower from the lesser. This is totally wrong, since both layers of each lateral ligament are derived from the greater sac alone.

As to the *liver*: An attempt has been made to correct former editions by the insertion of a new figure (Fig. 548), and by speaking of a “posterior surface.” The figure is all right, but should be labelled “*posterior and under surface of the liver*,” while the “posterior surface” in the text is limited only to the portion of liver “uncovered by peritoneum,” the *vena cava* and *lobus Spigelii* being placed, as of old, on the “under” surface. This mistake should not have been allowed to remain, as it is now well known that these two structures are perpendicular rather than horizontal, and are on the posterior surface. In connection with this Figs. 546 and 547 should have been omitted. In other respects the description of the liver is good. Finally, it is to be hoped that Fig. 532, on page 932, will never again be seen in any future edition of *Gray*. As showing the relations of the duodenum and other viscera it is simply grotesque.

As to the remaining sections, *i. e.*, *thorax*; *voice and respiration*; *urinary organs*; *male and female generative organs*; *hernia*, and the *perineum*, no comment is required except that the descriptions in former editions were deemed sufficiently good, and properly so, to be incorporated, with but slight changes, into the present edition. A great improvement is to be noted in the character of the illustrations of the bladder and female generative organs. The supra-renal capsules are newly and correctly described.

Finally, most favorable attention must be called to the additional paragraphs on surgical anatomy which have been inserted throughout the book, as well as to the paragraphs on surface form. These last occur

in each section, an arrangement much superior to that in former editions, in which all "surface forms" and "surface markings" are collected together under "landmarks" at the end of the book, thereby being rarely if ever noticed by the student.

B. B. G.

A DICTIONARY OF MEDICAL SCIENCE. Containing a Full Explanation of the Various Subjects and Terms of Anatomy, Physiology, Medical Chemistry, Pharmacy, Pharmacology, Therapeutics, Medicine, Hygiene, Dietetics, Pathology, Surgery, Ophthalmology, Otology, Laryngology, Dermatology, Gynecology, Obstetrics, Pediatrics, Medical Jurisprudence, and Dentistry, etc. By ROBLEY DUNGLISON, M.D., LL.D., Late Professor of Institutes of Medicine in the Jefferson Medical College of Philadelphia. Edited by RICHARD J. DUNGLISON, A.M., M.D. New (twenty-first) edition, thoroughly revised and greatly enlarged and improved, with the Pronunciation, Accentuation, and Derivation of the Terms. Octavo, pp. 1191. Philadelphia: Lea Brothers & Co., 1893.

For many years, in this country at least, Dunglison's was the one standard medical dictionary, and, as the present editor remarks with justifiable pride, two generations of students and practitioners have attested their sense of its usefulness. For many years, in fact, it was, one might almost say, the only medical dictionary. It passed through numerous editions, the last one appearing in 1874 and representing a decided advance on any of its predecessors. Since then many dictionaries have arisen, varying all the way from the tiny vest-pocket lexicon to the mammoth volumes of the Sydenham Society and of Foster. There have been medical encyclopædias, too, such as Quain's, Buck's *Reference Handbook*, and the various systems of medicine and surgery. None of these, however, quite took the place of Dunglison. Obsolete as the former edition had grown in many respects, through the enormous advances made in medicine since its appearance, the book still held its ground and retained its favor among students and physicians too. Nor was the reason for this far to seek. Other books were certainly more up to date, others were fuller and more encyclopædic, but none possessed to the same extent the combined merits of compactness and fulness that belonged to the time-tried Dunglison. While not too bulky, it was yet large enough to leave very few topics untouched upon; it was an eminently well-balanced book, and, in the larger articles particularly, its fulness of detail and the character of its matter, in which description largely replaced dry definitions, made it a valuable and also a very readable work.

The new Dunglison is new indeed—so changed, in fact, as to be really a new book rather than a revision of the old. Its bulk has been greatly augmented, for, though only some seventy pages longer than the former edition, the size of its page has been greatly increased. The editor informs us that 44,000 new words and phrases have been introduced; and anyone who looks through the book in search of changes will be quite prepared to credit the statement. The vast amount of new matter and the thoroughness with which the work has been brought down to date cannot fail to strike even the least observant reader. The immense

advances made in all branches of medical science here find representation; and one cannot wonder enough at the enormous industry implied in amassing and still more in sifting and co-ordinating such a wealth of material.

As in the old *Dunglison*, so in the new, the treatment of the longer articles, such as those defining the different diseases and those describing the various organs of the body, are the most satisfactory of all. The descriptive character of the older editions has been retained, and the amount of really valuable information conveyed is very great.

To make room for these additions a great deal of obsolete matter has been excised. We could wish that this pruning had been carried out a little more unsparingly, and that Dr. *Dunglison* had altered a little more in places the old-fashioned diction which gives the book now and then a somewhat antiquated flavor. But it seems hard to cavil at a superabundance when the old matter left in has not been allowed to crowd the new material out; and doubtless there are as many who would complain as loudly if the obsolete and obsolescent phrases which have been handed down as a legacy from dictionary to dictionary since the three great folios of James first saw the light of day were omitted.

A prominent and very useful feature of the old book is retained and amplified in this—we mean the tables which recur with great frequency and represent a vast amount of condensed information. To mention a few selected at random from among the many, we may enumerate the tables of Reflexes (on page 954), of Specific Gravity (on page 1021), of Plastic Operations (on page 876), of Dimensions of the Thorax (on page 1082), and of Wines (on page 1172); and we might add a great many others, old and new, which are eminently valuable and instructive.

The shorter definitions are in the main excellent, although they suffer somewhat from the extreme condensation of expression which was necessitated by the many additions. It would, too, have been an advantage if the different meanings of the same word, which are now grouped together in the same paragraph, had been placed in separate paragraphs, or had been separated in some other way, so as to show that they are distinct from one another.

The old *Dunglison* gave the accentuation of its terms; the new one gives their pronunciation also. The system adopted is extremely simple, and in many and probably the majority of cases, indicates very well the way in which the words should be sounded. We are inclined to think, however, that in the attempt to secure simplicity and avoid pedantic subtleties, the author has fallen into the opposite error and has sometimes failed to attain the necessary precision. Thus *Polycarpæ* is written *pol-e-kar'pe*, where the average reader would probably not grasp at once the phonetic value of the *e* in the second and fourth syllables, in which it represents the first *e* of scene. So *ku-ran'tur*, which is given as the phonetic equivalent of *Curantur*, may to the uninitiated mean either *kew-ran'tur* or *koo-ran'tur*. Moreover, in indicating the pronunciation of Latin the author is hardly consistent. For while he writes *Silene* as pronounced *sil-a'na* (i. e., *sil-ā'nā*), and *Sceloneus* he pronounces *skel-on'kus*, so that one would think that he is employing the Roman method altogether, he also writes *re'je-ah ak'wah* for *Regia Aqua*, and *pu-ta'men* for *Putamen*, which pronunciations are strictly in accordance with the English method, and he indicates *Regina Prati* by *rej-e'nah prah'te*, which is a mixture of the English and Roman methods. sh

In a book which has, like this, been so made over as virtually to constitute a first edition, typographical errors are unavoidable. Indeed, when we consider under what a tremendous high-pressure the author must have worked to accomplish what he has done, we can only wonder that errors are not much more frequent. Among those that we have noticed are Stenoraëic for Stenopæic, Thermotoxic for Thermotaxic, Pate'ra for Pat'era. Occasionally, too, the descriptions seem inadequate or faulty—*e. g.*, in the account of Scheiner's experiment. But, on the whole, these blemishes are few and far between and do not materially invalidate the general accuracy of the work. Indeed, in respect to accuracy and freedom from errors, the book quite equals and usually surpasses any of its contemporaries that we are acquainted with.

In typography and mechanical execution the book is excellent. The heavy type used for the headings and subheadings gives them a prominence suited to their importance, while the body of the work is printed in a text which is minute enough to be in marked contrast with the titles, and at the same time is very clear and legible. Moreover, in spite of the great amount of added matter and the consequent increase in the size, the book is not unhandy; it is bigger than before, but not too big—is still portable, and can be consulted without inconvenience or fatigue.

To sum up, we may say that the new Dunglison has most, if not all, of the good features which characterized the old; that in addition it has been brought down to date, so as to represent adequately the latest advances in medical science; and that it contains a vast amount of well-digested and well-arranged information presented in a manner very suitable for reference.

A. D.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE
MEDICAL SCHOOL AND HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

THE TREATMENT OF TUBERCULOUS PLEURISY.

DR. WILLIAM OSLER states that the indications are twofold: First, to limit and control the exudate and to promote its absorption. In the early stage it is sufficient to allay the pain, if severe, with opium; to reduce the fever, if high, by sponging, and to keep the bowels freely opened. It is doubtful whether the salicylates deserve the confidence which many claim. While fluid remains in the chest it is for the good reason that it cannot get out, owing to blocking of the lymph paths. Absorption from the pleura goes on, chiefly if not entirely, from the costal layer. Good results are seen from putting the patient on a dry diet, and giving brisk saline cathartics. Diuretin, when it acts, is useful in the same way. If at the end of ten days the exudate persists, and is at the level of the fourth rib in the erect posture, aspiration is advisable, and this may be repeated in a few days if the fluid reaccumulates. There are no greater risks in the tuberculous than in the simple sero-fibrinous cases, and it is very important to relieve the lung early of the compression to which it is subjected by any large quantity of fluid. The risk of the compressed lung becoming the seat of tuberculosis is not very great; more serious is the danger lest it should become bound down by such firm adhesions that it cannot expand. Gentle counter-irritation of the skin is probably beneficial in these later stages, stimulating the lymphatics of the costal pleura. In chronic sero-fibrinous effusion with thickening of the membranes, the fluid reaccumulates rapidly, and aspiration may have to be performed many times, and pulmonary gymnastics should be practised. If the exudate be purulent the case should be transferred to the surgeon for thorough drainage. The second indication is to improve in every way possible the general nutrition of the patient, so as to favor conditions promoting the healing of the tuberculous process. No doubt, as in pulmonary and peritoneal

infection, many instances of tuberculosis of the pleura recover, and leave no more damage than that associated with slight thickening of the membrane. A life in the open air, regular habits and exercise, a nutritious diet, and the use of the remedies which promote in every way digestion and the assimilation of food, should be advised.—*Transactions of the Massachusetts Medical Society*, 1893.

THE PHYSIOLOGICAL ACTION OF QUINOLINE, ISOQUINOLINE, AND SOME OF THEIR DERIVATIVES.

DR. RALPH STOCKMAN, stating the fact that quinoline, isoquinoline, and certain of their derivatives have a number of isomeric alkaloids of nearly similar constitution, but having certain of their atoms or radicals differently placed in relation to each other, believed that it would be of interest to ascertain whether those slight differences in chemical constitution exert any appreciable influence on the physiological action of the bodies in question, more especially as a number of complex alkaloids (such as quinine, cinchonine, strychnine, morphine) are thought to be derived from quinoline, while recently it has been proved that others (such as berberine, narcotine, papaverine, and hydrastine) are derived from isoquinoline. Quinoline (C_9H_7N) is a strong antiseptic and antipyretic, and depresses the central nervous system. Isoquinoline is isomeric with it, the only difference being that the atom of nitrogen occupies a different position. Experiments on frogs and rabbits showed no difference, either qualitative or quantitative, in the actions of the two substances (tartrates and methiodides). The physiological action of quinaldine (α methylquinoline), lepidine (γ -methylquinoline), α - γ -dimethylquinoline, orthotoluquinoline, and paratoluquinoline, were also investigated. Tartrate of quinaldine has, in frogs and rabbits, an action similar to that of quinaldine or isoquinoline, but it is somewhat less active. The dimethylquinoline is still less active, and therefore it would appear that the substitution of methyl radicals for hydrogen atoms in quinoline weakens its depressing action on the nervous system. With the other substances observations were made on frogs only, the sulphates, which are fine white crystalline salts, being used. Their actions seemed similar in every respect to that of quinaldine. It is evident, therefore, that in the quinoline molecule the position of the nitrogen atom, or of the methyl radical does not exert any appreciable influence on the physiological action of these substances, and further, that the substitution of CH_3 for H only slightly alters its action, and that only in degree and not in kind. It is improbable also that the derivation of a more complex alkaloid from quinoline or isoquinoline respectively, is in any way a factor which determines its action, seeing that these two substances have exactly similar reactions.—*The Journal of Physiology*, 1893, No. 3, p. 245.

THE INFLUENCE OF SALT-BATHS UPON THE NITROGENOUS EXCRETION IN MAN.

DR. RUDOLF KÖSTLIN, from his very careful observations, has reached the following conclusions: 1. A simple warm bath of an hour's duration is without influence in albuminous metabolism. 2. A 4 per cent. bath of Stassfurter bath-salt diminishes the nitrogenous excretion about fifteen to twenty grains.

3. A 20 per cent. bath of Stassfurter salt acts as does the 4 per cent. 4. Cooking-salt baths, 4 per cent. as well as 20, are without influence on metabolism. 5. Warm mustard baths do not influence the albuminous metabolism. Stassfurter bath-salt contains chloride of soda, 19.5 per cent.; of potash, 24.1 per cent.; of magnesium, 38.7 per cent.; of calcium, 0.6 per cent.; and of sulphate of magnesia, 16.6 per cent.—*Fortschritte der Medicin*, 1893. Bd. xi, S. 727.

CLINICAL EXPERIENCE WITH SENNA CATHARTIC ACID.

DR. KARL DEHIO notes that Kubly has isolated a substance from senna leaves which he believes to be the active principle, and to which he has given the name of cathartic acid. As this substance is irregular and unreliable in its action, it seems fair to conclude that it is not a chemically pure body. Gensz has also isolated an active principle of senna leaves, to which the same name has been given, although it is not identical with that mentioned above. The latter is a brownish-yellow powder with difficulty soluble in cold, but readily in hot water, and of weakly acid reaction. Further investigation will determine if it be identical with the active principle of rhubarb and frangula. In dose of from one to three grains it produces, after five to seven hours, watery movements, sometimes accompanied by somewhat severe cutting abdominal pains, but usually it is of entirely painless action. The results of its use in twenty-one persons are recorded, generally in single dose and in the form of tablets. In general in healthy persons, with frequent and copious evacuations, considerable pain was observed, while in cases of simple constipation it found favor because it did not cause any very severe pain. The slower its action the less pain resulted. As the remedy does not have an unpleasant taste, rubbed up with sugar it will be readily taken by children. The dosage can be made more accurately than with other senna preparations. The more obstinate the constipation the milder appears to be the operation of this remedy, and in these cases this should be the cathartic to be chosen.—*St. Petersburger medicinische Wochenschrift*, 1893, No. 27, S. 255.

REST IN THE TREATMENT OF CHLOROTIC ANÆMIA.

DR. FREDERICK TAYLOR believes that the very important factor which has been too little regarded, or even ignored altogether, is physical or bodily rest. Arguments which are advanced are: an essential feature of the developed disease is a deficiency of hæmoglobin in the blood. By saving the expenditure of hæmoglobin the patient may utilize what little she has to greater effect, and sooner arrive at a favorable balance than if her income in food, in oxygen, and in iron were alone cared for while the expenditure in muscular exercise and the additional employment of the respiratory and cardiac functions were entirely neglected. If the heart is found to be dilated the argument is all the stronger, since this is a sufficient ground for requiring that physical rest shall be enjoined. It is a familiar fact that these cases improve rapidly when admitted to a hospital, although it cannot be urged that they are very much benefited by the air, food, or exercise which they get there. Iron should be given in the most suitable form, and a perfect action of the bowels should be maintained. Against fresh air nothing can be said so long as it does not involve exercise, either by walking or riding.

In slighter degrees of anæmia, or in one already recovering, carriage exercise may be allowed, while in the severer forms the patient may with advantage be kept in bed entirely—the most certain means of keeping a patient absolutely at rest. An intermediate prescription is that the patient shall get up only for three or four hours in the afternoon.—*The Practitioner*, 1893, No. 303, p. 161.

DUBOISIN AS A REMEDY FOR ATTACKS OF HYSTERO-EPILEPSY.

PROF. PETER ALBERTONI, noting the recent communications concerning the sedative action of this remedy, has made use of it in three cases. The sulphate was used by injection in the dose of one one-hundred-and-sixtieth of a grain, although Samuely, in a case reported in this paper, has made use of the dose of one thirty-second of a grain. He concludes that it is a useful remedy for the purpose above mentioned.—*Therapeutische Monatshefte*, 1893, Heft. 8, S. 409.

DERMATOL DERMATITIS.

DR. MATHEUS has used dermatol in his practice often and successfully not only internally but also externally. Unpleasant complications he has observed in an ulcer of the leg when there was a marked inflammation of the surrounding skin. Usually the case goes on without any dermatitis, but recently he has observed three cases. He uses the remedy as a dusting powder morning and evening, the patient remaining in bed. The dermatitis appeared at the end of the first or the beginning of the second week, the skin which was involved was strongly reddened, felt hot to the touch, and secreted a large amount of watery fluid, and in one case was the cause of considerable disturbance of the general condition.—*Therapeutische Monatshefte*, 1893, Heft 8, S. 402.

LYSOL.

DR. C. B. ADAMS, from a series of laboratory experiments, is convinced of the powerful germicidal action of lysol, and believes that it is deserving of high rank, because—1. Of its power in weaker solutions as compared with carbolic acid. 2. It is but slightly, if at all poisonous to the system. Gerlach and Sugg showed by actual demonstration that carbolic acid was eight times, and creolin twice as poisonous as lysol. 3. It is the most easily soluble of all disinfectants. 4. It is reasonable in cost. 5. It is of great value as a deodorizer. In wounds its oily properties act as a soap, and thus it more deeply penetrates the tissues.—*Notes on New Remedies*, 1893, No. 3, p. 40.

DR. E. P. MURDOCH believes that in the choice of an antiseptic—1, safety; 2, efficiency; 3, adaptability and ease of handling; 4, freedom from unpleasant results must be considered. He has used lysol in a number of cases of railroad injuries with perfect satisfaction; this, too, when the severe contusion, so common in these injuries, produced extensive sloughing. He reports two instances of its use. He has found this antiseptic to be safe, pleasant, and efficient. As compared with bichloride, it is its equal in efficiency, and it possesses the advantage of being free from toxic effects. Because of its anæsthetic properties it is a most satisfactory dressing for burns.—*The American Therapist*, 1893, No. 3, p. 72.

MEDICINE.

UNDER THE CHARGE OF

W. PASTEUR, M.D. LOND., F.R.C.P.,

ASSISTANT PHYSICIAN TO THE MIDDLESEX HOSPITAL; PHYSICIAN TO THE NORTHEASTERN
HOSPITAL FOR CHILDREN;

AND

SOLOMON SOLIS-COHEN, A.M., M.D.,

PROFESSOR OF CLINICAL MEDICINE AND APPLIED THERAPEUTICS IN THE PHILADELPHIA
POLYCLINIC; PHYSICIAN TO THE PHILADELPHIA HOSPITAL.

DISCHARGE OF GALL-STONES WITH SEVERE HÆMATEMESIS.

LYCETT (*Brit. Med. Journ.*, 1893, No. 1706) records the following case: B. P., aged twenty-seven years, after premonitory hepatic symptoms accompanying a distended gall-bladder, vomited about a pint of arterial blood. Subsequent motions contained altered blood and numerous calculi, some as large as horse beans. Hæmatemesis recurred on the fifth and tenth day; with the first hemorrhage was ejected a gall-stone larger than any passed per rectum. Considerable collapse followed the last hemorrhage. At no time was jaundice present, nor did the urine contain bile. Abdominal section was considered in conjunction with Dr. Wade, but not deemed advisable.

FATAL CASE OF PYRIDINE POISONING.

HELME (*Brit. Med. Journ.*, 1893, No. 1711) reports the following case: A muscular man, of twenty-nine, employed as stillman at some tar works, was admitted at 10.30 P.M. He stated in a thick guttural voice that he had swallowed "half a cupful" of pyridine bases at 3 P.M. that day, and had vomited five times during the intervening seven hours. State on admission: Pale, perspiring freely, dry white tongue, slightly cyanosed lips; temperature 103.4°; pulse 128, weak and intermittent; respiration 40; coarse mucous râles in trachea; complained of tightness in breathing, with choking sensation and pain over the stomach. Demulcents were given in very small quantities by the mouth, and three ounces of brandy by enema. Later he could swallow a little better. The white frothy expectoration and the breath smelt of pyridine. Nine hours after the accident the temperature was 104° F., but fell again to 99° within six hours. The bowels acted six times during the night. Partially formed light stools not smelling of pyridine. At 8 o'clock next morning sputa became purulent and lost odor of pyridine. There were signs of acute congestion and bronchitis over the lungs. At 4 P.M. he became wildly delirious, and he died next morning, forty-three hours after the accident. The temperature during the last night varied between 104° and 105.8°. Ten ounces of urine were passed during the last twenty-four hours, and the bowels were relieved six times.

At the post-mortem examination, made twenty-nine hours after death, the epiglottis was found congested on its under surface. The larynx and trachea

were lined by a friable yellow membrane, the large bronchi contained purulent matter, and were lined by a similar membrane. The lungs were congested and œdematous. Nothing was observed about the mouth, tongue, or fauces, but the œsophagus and cardiac end of the stomach were greatly congested, the pyloric end and the commencement of the duodenum being slightly congested. The only changes found throughout the intestines were a few small petechiæ in the small intestine. The liver was of normal size, and showed a few small fatty patches on its upper surface. No changes were detected in the heart, kidneys, or spleen, and no odor of pyridine was observed throughout the examination.

INFANTILE ECLAMPSIA WITH SLOW PULSE.

MORRISON (*Lancet*, 1893, No. 3662) relates the following case: Female child, aged nineteen days. The attack appeared to have been caused by injudicious feeding. When first seen her condition was as follows: Respiration was about 12 per minute, very slow and infrequent, and prolonged into a stertorous snore, such as one observes shortly before death; the heart's beat was about 10, 15, and 20 per minute; the body was cold; the patient was perfectly unconscious, and the pupils were contracted to the size of a small pin's head; both pupils were equally contracted. There was no convulsion beyond an occasional quivering of the lips and rapid convulsive protrusion of the tongue. Ether inhalation and artificial respiration produced very transient effects. From 40 to 60 drops of B. P. tincture of belladonna was then injected into the rectum in a little water, and a few minutes later, as no effect was observed on the pupils or the heart, another half-teaspoonful was given by the mouth and pushed well down the throat. In a few moments, and quite suddenly, the pupils dilated to about three millimetres in diameter, and forthwith the heart bounded away like a steed which had suddenly wrenched itself loose from its fastenings. This acceleration continued for a longer time and was much more marked than that which followed any previous excitant; but it, too, at length began to yield to the comatose lethargy which appeared to be invincible. Then again was given a similar quantity of tincture of belladonna and ether by the mouth, which was followed by a further dilatation of the pupils and increased cardiac acceleration. In all, the child had ninety minims of tincture of belladonna (B.P.) and from twenty to thirty minims of ether in addition to that inhaled. Consciousness did not return until several hours after the recovery of the circulation and respiration. Within twelve hours the pulse rose to 202, and the temperature to 104°. An ice-compress to the head and a little iced water by the mouth were immediately followed by rapid slowing of pulse and fall of temperature, and the condition became once more critical. The child ultimately recovered.

THE DISINFECTION OF HOUSES INFECTED WITH THE BACILLUS TUBERCULOSIS.

RANSOME and DELÉPINE (*Brit. Med. Journ.*, 1893, No. 1714) have made a preliminary report on this subject. Experimental investigations were made to test the value of the methods used by the municipality of Manchester for

disinfecting rooms which had been occupied by certain classes of tuberculous persons. The method pursued was as follows :

"Pieces of wall paper (or, in later experiments, of ordinary paper) were carefully sterilized in glass capsules. They were then infected with tuberculous material, either sputum or pure cultivations of bacillus tuberculosis (human in most cases, avian in a few), then the capsules were sealed, the sputum or cultivation being allowed to dry on the paper. These were then sent to the officer who had to disinfect certain rooms. The capsules were opened just before the acid was poured on the chlorate of potash, and sealed again when the room was reopened. The capsules were sent again to the laboratory, where rabbits and guinea-pigs were inoculated with small pieces of infected paper or superficial scrapings, mixed with sterilized bouillon. In all cases control experiments were made with pieces of paper treated exactly in the same way, but kept in the laboratory until the capsules which had been sent out had been returned.

"Some other precautions were also taken to avoid fallacies which might be caused by the effect of drying or of exposure to light, or of some unknown irritating properties of the wall paper in use. It was also found desirable to use tuberculous matter from various sources."

The author's conclusions, based on thirty-four experiments, are as follows :

"I. Intra-peritoneal injections of scrapings of wall paper sterilized by heat (result negative, as expected).

"II. Intra-peritoneal injection (in rabbits) and subcutaneous inoculation (guinea-pigs) with scrapings or bits of paper infected with tuberculous sputum, and exposed to the action of euchlorine in rooms that were being disinfected. Nine experiments made with three different kinds of sputa; the results show that the effects of the disinfecting process are uncertain; in some cases complete disinfection seems to have been obtained, but the control experiments (III.) show that some sputa are not so virulent as others.

"III. Intra-peritoneal injection (rabbits) or subcutaneous inoculations (in guinea-pigs) with paper infected with tuberculous sputa, the papers not being afterward exposed to the action of euchlorine. Eight experiments, five of which were made with the sputa used in Series II.; one of these sputa acted very slowly, this possibly accounting for the apparently complete disinfection of papers infected with that sputum.

"IV. Inoculations with papers infected with tuberculous sputum, and allowed to dry in the dark for forty-five days. Two experiments; doubtful result in one rabbit, typical tuberculosis produced in a guinea-pig.

"V. Inoculations with papers infected with tuberculous sputum and allowed to dry in the air for forty-five days, being at the same time exposed to daylight. Two experiments; no certain evidence of tuberculosis could be found eighty days after inoculation.

"VI. Inoculations with paper infected with pure cultivations of bacilli obtained from a case of human tuberculosis not disinfected afterward. Four experiments; in all cases marked evidences of tuberculosis were found within three weeks from date of inoculation.

"VII. Inoculations with papers infected with pure cultivations of bacilli of avian tuberculosis, and not disinfected afterward. Three experiments; distinct signs of infection were obtained within three weeks from the date of

inoculation, but, of these animals, two being allowed to live, one recovered, and slight traces only of tuberculosis were found in the other thirty-five days after inoculation.

"VIII. Inoculations with papers infected with pure cultivations of bacilli of human tuberculosis (see VI.), and afterward exposed to the action of euehlorine in rooms that were being disinfected. Six experiments; in all cases distinct evidences of tuberculosis were observed within three or four weeks from the time of inoculation."

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE
UNIVERSITY AND GERMAN HOSPITALS;

ASSISTED BY

ALFRED C. WOOD, M.D., AND C. L. LEONARD, M.D.,

INSTRUCTOR IN CLINICAL SURGERY, UNIVERSITY OF PENNSYLVANIA; ASSISTANT SURGEON, UNIVERSITY HOSPITAL.	ASSISTANT INSTRUCTOR IN CLINICAL SUR- GERY IN THE UNIVERSITY OF PENNSYLVANIA.
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A CASE OF INTRA-CRANIAL INJURY.

CONSIDERABLE knowledge has been gained concerning the functions of the brain, and especially of the position of the centre of so-called muscular sense, by the case reported by LAYLOCK (*Australian Med. Journ.*, July, 1893), occurring in the service of COOKE. The patient, twenty-nine years of age, received a blow upon the head from the falling limb of a tree. On admission to the hospital there was unconsciousness with great restlessness and delirium. The vertex was extensively fractured, and in the wound were pieces of bone and brain substance. The gap in the cranium measured three by four inches. An exploration with the finger showed a linear fracture about one-quarter of an inch wide in the base of the skull just behind the orbits. The right frontal bone could be easily moved, and in fact the skull had been practically split in two in the line of the blow. The author gives the following as points of interest: "From the nature of the injury, a zone of brain substance just in front of the fissure of Rolando would bear the brunt of the blow, and its left half would, at least, be severely concussed. This left half would include Broca's convolution (the centre of speech), and the anterior end of the temporal lobe (one of the auditory centres)." The symptoms shown at first showed that the auditory and speech centres were in a state of extreme excitability, and that a spoken word set in automatic motion all these centres and produced speech. There were also movements of the right arm that showed its cortical centre to have been in a state of irritation at first. The late symptoms of cramp and burning pain in the right arm, with weakness, are rather ominous, and lead to the suspicion of deep mischief on the left or

opposite side. The part of the brain destroyed on the right side is, with the exception of the base of the falciform lobe, the area regarded as the motor. "Nevertheless, the sensory and motor functions of, say, the arm, as it is the part most involved, seem to be affected in a relatively equal degree, and both of these functions seem to have been cut down to a very rudimentary level."

"On the sensory, or, to be more exact, the afferent side, there is simple tactile sensibility, but there is absence or deficiency of the higher conceptions of sensation, which are evolved from the lower and simpler levels, such as the position of the limb, the qualities and positions of foreign bodies touching the part, their weight, resistance, etc." Simple movements can be made, but the power of making more complicated co-ordinated movements is wanting. "As both of these afferent and efferent functional disturbances are the result of one and the same injury, it follows that the part destroyed, that is, part of the Rolandic area—is sensory-motor."

From the experience gained by this case, this author would be led to fill up the anterior half of the anterior limb of the internal capsule, and call these the tracts of the so-called muscular sense, or, as he prefers to call it, the sense of local relation.

The patient recovered to a great extent, but not entirely.

TREPHINING FOR FOCAL EPILEPSY.

AN interesting case of trephining for traumatic focal epilepsy, with electrical stimulation and excision of the focus, is reported by PARKER (*Brit. Med. Journ.*, May 27, 1893). The patient was a boy, aged nine years; there was a history of a fall on the right side of the head, followed by vomiting. The family and personal histories were good. The first signs noticed were tremors in the left hand that gradually increased in frequency and severity. There were, in addition to the movements of the hand, arm, and shoulder, twitchings of the head and turning of the eyes toward the right side, and later the patient used to fall; the fits were always of short duration, and the patient never injured himself or bit his tongue. There was no cry, and auræ were slight and scarcely noticed. It was decided to trephine over the genu of the fissure of Rolando to expose the centre for the thumb and wrist. A button one and a half inches in diameter was removed and the centre found to lie directly below it. No antiseptic was used after the opening of the dura mater, boiled water being used instead in order that stimulation by the faradic current might not be interfered with. This stimulation produced contractures of the thumb and wrist, and the portion stimulated was removed by a sharp spoon after incising the pia mater. After the operation and the patient's recovery from it, he improved slightly, but time alone can give the verdict.

AN IMPORTANT COMPLICATION IN CARIES OF THE SPINAL COLUMN.

THE fact that irregularities of the spine in a lateral direction sometimes accompany caries of the vertebræ has long been known, but NOBLE SMITH (*Prov. Med. Journ.*, September, 1893) thinks it has generally been attributed to a predominance of the disease upon one or other side leading to bony deformity. It is a most serious matter that the importance of this combination

of lateral curvature with caries should be recognized, and he feels that it has not received adequate attention. He is opposed to the treatment of all forms of lateral curvature by exercise, although he admits that we often meet with the ordinary appearance of scoliosis. He has met cases in which such exercise has rapidly developed an obscure case of caries, "the lateral deviation having been considered as conclusive evidence that no inflammatory disease was present. That lateral deviation may occur in caries from structural changes has long been recognized, but that lateral curvature of the ordinary scoliotic form should accompany and even precede the majority, or at least a great number of the ordinary cases of caries, has not been generally acknowledged. The latter is a curvature with rotation which accompanies the caries and which extends beyond the area of inflammation and it is essentially the result of weakness and discomfort." He has observed lateral deviation to accompany caries in the following varieties: 1. From general weakness. 2. From spasmodic muscular action. 3. Independently. 4. From lateral loss of substance. He reports a series of such cases.

SURGERY OF THE ANKLE-JOINT.

AN ingenious and interesting operation is reported by TENIER and HENNEQUIN (*Rev. de Chir.*, August, 1893), in which they reproduced the functions of the ankle-joint after the loss of the inferior extremity of the fibula and the absence of the internal malleolus. They conclude that this operation demonstrates the possibility: 1. Of making exclusively from the end of the tibia a joint which allows little to remain wanting in function, and nothing in solidity or regularity. 2. Of preserving entirely the position, the direction, and the function of tendons displaced during the operation, accomplishing this by not opening their sheaths, but removing with them the adjacent periosteum to which they are adherent. 3. Of creating a re-arthritis, so to speak, in its entirety, reproducing with fidelity the normal articulation, and to a certain extent all its movements, except that the tibial surface was made in spongy bone tissue, and in consequence was devoid of cartilage, and the astragalus had lost part of its cartilaginous surface through fibrous degeneration. The patient recovered completely the use of the foot, and could walk with ease, though flexion and extension were slightly limited.

THE CAUSATION OF HEMORRHOIDS.

IN contrast to the work done by Thompson is the theory of QUÉSNÜ (*Rev. de Chir.*, March, 1893), who says: Hemorrhoids are made up of varicose changes, not in one or two veins, but from a number of smaller branches and capillaries in the mucous membrane, the submucosa, and also in the muscularis; their changes are due to injuries to the walls, to an inflammation of the inner wall, which reaches by contiguity the surrounding structures. The arteries do not participate in this. Not until the vessels, either from an inflow of alcohol, gout or rheumatism, etc., or through the direct influence of micro-organisms from the intestine, are attacked, and the inflammation by these means deprives their walls of their elasticity, can an increase of blood-pressure cause their dilatation, lengthening, and varicose condition even to bleeding.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

J. SOLIS-COHEN, M.D.,
OF PHILADELPHIA.

RHINOLITHS.

COZZOLINI has reported (Morgagni, March, 1893, cited in *Annales des Mal. de l'Oreille, etc.*, 1893, t. xix. No. 8) a case of rhinolith which had produced partial destruction of the nasal septum so that it occupied both nasal fossæ. This is said to be the only case of that description on record beside one found on the cadaver by Zuckerkandl (*Norm. und path. Anatomie der Nasenhöhle, etc.*, 1892, Bd. ii. p. 158).

Cozzolini has also reported (*Revista Clinica e Terapeutica*, June, 1893, *idem*) a case of two rhinoliths occupying the same nasal fossa. Cozzolini operates by insinuating bent probes behind the body so as to drag it forward—a procedure he considers preferable to the use of forceps, which usually push the rhinolith more deeply into the nasal passage before it can be securely grasped.

Cozzolini makes a distinction between true rhinoliths in which the calcareous deposit becomes formed around a nucleus of mucus or of blood, and false rhinoliths, the more common, in which a foreign body such as a cherry-stone, a bead, or the like, has formed the nucleus. The former, he states, are rarely found before the fortieth year of age; the latter may be found at any age, the foreign body often having been inserted in play during childhood.

VASCULAR POLYPI OF THE NASAL SEPTUM.

DR. SCHADEWALD has reported three cases, the growth from one of which he showed at the Laryngological Society of Berlin (*Annales des Mal. de l'Oreille, etc.*, 1893, t. xix. No. 8). It was the bulk of a lentil and tolerably firm in consistence. Compression with the finger serves to restrain the hemorrhage after extirpation. He has never seen them in males, but Flatau has had two cases in men. Heymann, on microscopic examination, has recognized an angioma with large spaces, separated only by narrow barriers of granulation tissue.

ABSCESS OF THE FRONTAL SINUS.

DR. L. LICHTWITZ, of Bordeaux, reports (*Annales des Mal. de l'Oreille, etc.*, 1893, t. xix. No. 8) a case of latent empyema of the left frontal sinus thoroughly cured by topical injections of antiseptic solutions after a year's treatment. He states that this case and one of two similarly treated by Schutter are the only cases on record cured by injections into the sinus by the natural orifice without external intervention. He states that the pus withdrawn from the sinus with all antiseptic precautions contained the pneu-

micrococcus of Talamon-Fraenkel in very great abundance, and that its virulence was established by inoculations into mice—a fact which he claims explains the possibility of infection of the meninges from disease of the frontal sinus.

SARCOMA OF THE NASAL SEPTUM.

DR. A. D'AGUANNO, of Palermo, reports (*Annales des Mal. de l'Oreille, etc.*, 1893, t. xix. No. 9) a case of sarcoma of the nasal septum in a girl eleven years of age. A month before he saw the case a minute tumor was detected upon the right side of the septum, near the orifice. Within the month it had grown to the size of a large haricot bean. It was implanted transversely on its posterior half only; its surface was rugous, and it bled upon being touched with a probe. The free portion was excised with the cold snare, and the electric cautery was employed to destroy the sessile portion. Some subsequent cauterizations were necessary. At the end of two months there had been no recurrence. On microscopic examination by the professor of pathologic anatomy at Palermo, Dr. Sirena, the growth was found to be a polymorphous sarcoma, lympho- and fuso-cellular.

PRIMARY DIPHTHERITIC CROUP AND ABSCESS OF THE LARYNX.

THE rarity with which tracheotomy in the adult prevents death from diphtheria is exemplified in an interesting case recently reported by M. KOCH to the Belgian Society of Laryngologists (*Annales des Mal. de l'Oreille, etc.*, 1893, t. xix. No. 10). A woman was afflicted with intense dyspnoea. The pharynx was healthy, but an abscess discharging pus was seen underneath the vocal bands. The following day in a violent paroxysm the patient ejected a large membrane measuring some seven centimetres in length. Tracheotomy was necessary and permitted the evacuation of some more pus. There was temporary amelioration, but evidences of infection were present the next day, and the patient died in the evening. Microscopic preparations from the false membrane were filled with micrococci and the bacilli of Löffler.

PROLAPSE OF THE VENTRICLE OF THE LARYNX.

IN a case of prolapse of the ventricle of the larynx recently exhibited at the Laryngological Society of Berlin, PROF. B. FRAENKEL demonstrated (*Annales des Mal. de l'Oreille, etc.*, 1893, t. xix. No. 8) that the prolapse consisted of the lateral wall of the ventricle. The superior portion of the vocal band which touched the prolapse seemed to be modified in its structure. The muscular fibres of the thyro-arytenoid seemed to be atrophied. The connective tissue and the epithelium seemed to be hypertrophied, so that the image recalled that of pachydermia.

LIPOMA OF THE TONGUE.

DR. JULIUS ROSENSTIRN, of San Francisco, reports (*Medical Record*, 1893, vol. xl., No. 13) and illustrates a case of lipoma on the base of the tongue in a tuberculous subject, with lipomata in other portions of the body. The article contains a summary of the literature on the subject.

DERMATOLOGY.

 UNDER THE CHARGE OF

LOUIS A. DUHRING, M.D.,

PROFESSOR OF DERMATOLOGY IN THE UNIVERSITY OF PENNSYLVANIA;

AND

MILTON B. HARTZELL, M.D.,

INSTRUCTOR IN DERMATOLOGY IN THE UNIVERSITY OF PENNSYLVANIA.

 THE RELATION OF CERTAIN SKIN DISEASES TO DISTURBANCES IN THE DIGESTIVE TRACT.

A. PICK, in discussing this subject (*Wiener medizinische Presse*, 1893, No. 31), thinks it probable that, in the digestive tract of those individuals in whom the ingestion of certain articles of food gives rise to urticaria, ferments or micro-organisms occur which form poisons out of substances contained in these foods; and points out the fact that urticaria and erythemata frequently occur in such persons as suffer from a slowing of the movements of the alimentary canal, in consequence of which abnormal fermentation and putrefaction of the ingesta occur. The author relates a case in which he was able to prevent the appearance of an urticaria, which always followed the use of potatoes and preserved fruit, by the administration of 5-ctgm. doses of creosote. After taking this drug for a week it was suspended experimentally, when the eruption again appeared upon the use of the above-mentioned food. With the resumption of the creosote the urticaria again disappeared.

 GALLANOL IN PSORIASIS AND ECZEMA.

UNDER the name *gallanol*, MM. CAZENAVE and ROLLET (*Journal des Maladies Cutanées et Syphilitiques*, July, 1893) have employed in psoriasis and eczema the anilide of gallic acid, which in the impure state is known as gallol. This substance is non-toxic and non-irritating, and possesses reducing and antiseptic properties. In a patient affected with a psoriasis of eleven years' duration a cure was obtained in a short time by painting the lesions with a mixture of chloroform or alcohol and gallanol, and afterward covering them with traumaticin. In another case, which had been treated without appreciable result by chrysarobin and pyrogallol, great improvement followed these applications. In eczema the action of gallanol is rapid in the oozing forms, relieving the itching quickly. The authors have applied the remedy in powder, in ointment, and by painting it upon the diseased skin. The powder, white, impalpable, and slightly adhesive like aristol, does not cause burning, and quickly relieves the itching of chronic eczema. The ointment, made up with vaselin, has been used in 3-25 per cent. strength. Gallanol causes neither redness, inflammation, nor pigmentation of the skin, does not soil the linen, is odorless, and for these reasons is to be preferred to chrysarobin and pyrogallol.

METASTASIS OR SHIFTING ELIMINATION AS A FACTOR IN CERTAIN SKIN INFLAMMATIONS.

WALSH (*British Med. Journ.*, August 26, 1893) advances the theory that certain forms of dermatitis connected with abnormal conditions of the blood may be directly due to the elimination of irritating substances. Uric acid and the scarlatinal virus may be regarded as types of unusual substances circulating in the blood which are capable of causing inflammation of one or more of the channels of elimination. Uric acid in excess being highly damaging to the epithelium of excretory organs is able to produce, besides dyspepsia, nephritis, bronchitis, some forms of dermatitis. Metastasis is often a marked feature in gout, a typical eczema sometimes occurring during an acute gouty attack, and disappearing under treatment with colchicum. The skin trouble may alternate with bronchitis and asthma, or with diarrhoea. The scarlatinal poison, like uric acid, acts as an irritant upon the epithelium of excretory organs, and may cause dermatitis in addition to nephritis and inflammations of the respiratory and alimentary tracts. Dr. Walsh holds that if uric acid be excreted by the bowel, diarrhoea results; by the skin, dermatitis; by the kidney, nephritis; by the lung, bronchitis—these various inflammations being the result of excretory inflammation.

INFECTIOUS LENTIGO OF THE AGED.

AT a meeting of the Société de Médecine et de Chirurgie de Bordeaux (*Journal des Maladies Cutanées et Syphilitiques*, June, 1893) M. DUBREUIL presented a patient who for twenty-five or thirty years had had a red spot upon the left cheek consecutive to an injury. This patch during the past six years began to be pigmented. A year later in the neighborhood of this pigmented patch a small epithelioma developed, which was removed. Four years later a new epithelioma appeared, not in the cicatrix, but near it.

The author is inclined to regard the affection as allied to *xeroderma pigmentosum*, since, in addition to the pigmentation, vascular patches are present.

A CASE OF DERMATITIS HERPETIFORMIS.

AT the session of January 6, 1893, of the Dermatologische Vereinigung zu Berlin (*Monatshefte f. prakt. Dermatologie*, Bd. xvii. No. 5) PETER presented a case of dermatitis herpetiformis in which the herpetic character was clearly marked.

The patient was a woman, thirty-eight years old, who in her twentieth year first suffered from an erythematous, or rather a wheal-like, strongly itching eruption upon the thigh, which was followed by vesicles arranged in rings or circles. The vesicles dried up or were scratched, leaving pigmented scars which were clearly marked off from the surrounding skin by a dark border. Alteration of the general condition, depression, even attacks of fever, preceded the outbreak of the eruption. For almost ten years the disease remained limited to the lower extremities, the attacks being repeated at not very great intervals. In the last eight years the process has involved the upper arm and the shoulder, presenting here the same appearance as on the lower extremities, with the exception that the vesicles are crowded into a smaller space.

OPHTHALMOLOGY.

 UNDER THE CHARGE OF

 GEORGE A. BERRY, M.B., F.R.C.S. EDIN.,
 OPHTHALMIC SURGEON, EDINBURGH ROYAL INFIRMARY;

AND

 EDWARD JACKSON, A.M., M.D.,
 PROFESSOR OF DISEASES OF THE EYE IN THE PHILADELPHIA POLYCLINIC; SURGEON TO
 WILLS EYE HOSPITAL, ETC.

REFLEX AMBLYOPIA DURING PREGNANCY.

MR. A. LAWFORD KNAGGS (*British Medical Journal*) reports a case in a woman, aged forty, who during a previous pregnancy, eight years before, had noticed a dimness toward the left side, but did not discover that her left eye was blind till a month after her confinement. Since then she has had four children without any trouble with her sight. The left eye was quite diverged, and presented a bluish-gray atrophy of the disk, with arteries only half the size of the veins, which were of good calibre. In the right eye vision 5/10. She came for glasses, having hyperopia 3 D. Optic disk regarded as sound. She was then four months pregnant. Six weeks later vision had fallen to 5/35, and the field of vision was considerably smaller than normal. Vision continued to diminish and the field of vision to contract, and color vision was abolished. The optic disk was regarded as pale, but it was doubtful whether any change in its appearance had taken place. Premature labor was induced at the end of six and one-half months of pregnancy. Within two weeks vision had begun to improve and the fields of vision to increase in size, except that the right inferior quadrant remained almost completely obliterated. After six months vision reached 6/6, and color vision was completely restored.

A similar case has been reported by Valude.

Knaggs concludes: If repeated careful observations show—1, that acuteness of vision is rapidly diminished; 2, concentric contraction of the field of vision, and that this is increasing; 3, color perception impaired; and 4, that there is no disease of the fundus to be seen with the ophthalmoscope—the prognosis as to sight is very serious. The period for expectant treatment has gone by, and abortion or premature labor should be induced without delay. To wait is to run a great risk of permanent blindness; to interfere, if the amblyopia is not too far advanced, is to insure recovery.

 CATARACT EXTRACTION.

HIPPEL (*Münchener medicinische Wochenschrift*), after referring to the fact that in spite of the age of the cataract operation and the numerous workers who have labored to perfect it, there is still lack of any full agreement as to the manner of attaining the greatest safety, describes his own method and its results.

The necessary instruments are boiled in a soda solution and then laid in a 2 per cent. solution of carbolic acid. The bandages are sterilized by steam, the cocaine solution by heat. The lids and cilia of the patient are washed with soap, alcohol, and a sublimate solution of 1:2000. The conjunctival sac immediately before the operation is flooded with a 1:5000 sublimate solution. He makes the incision in the limbus, including about one-third of the corneal circumference, with the Graefe knife, and excises a small piece of the iris and as large a piece as possible of the anterior capsule, using capsule forceps. The eye is dressed by dusting a little iodoform on the wound, and both eyes closed with bandage. The eye operated upon is kept closed for four or five days, and the patient confined to bed.

His results have been—vision of one-half or over in 61 per cent., one-tenth to one-half in 36 per cent., less than one-tenth in 2 per cent., and complete blindness in 1 per cent. Of six cases having vision of less than one-tenth, two had old central chorioiditis, two opacities of the vitreous, one was a case of amblyopia, probably congenital, and one partial infection with iritis and pupillary exudate. Division of the capsule for secondary cataract was done in 33 per cent. of the cases.

THE TREATMENT OF CORNEAL ULCER, WITH HYPOPYON.

THE treatment of this condition adopted at the Ophthalmic Clinic of Montpellier (*Nouveau Montpellier Médical*, ann. xxxvi., No. 4) is: After instillation of cocaine, practise antiseptic irrigation of the eye with careful washing of the cul-de-sac of the conjunctiva and of the lacrymal passages. If the ulcer be superficial, the hypopyon not great, the cornea in good condition, and tension of the eyeball not increased, the application of the actual cautery to the margins and base of the ulcer completes the treatment. If the ulcer be deeper, but the cornea not yet threatened with perforation, the use of the actual cautery is combined with a paracentesis. And if the ulcer is deep and perforation probable, the Saemisch operation is practised with cleansing of the anterior chamber and application of the cautery to the margins of the ulcer. This is followed with instillations of cocaine, atropine, eserine, or of sublimate 1:1000, warm antiseptic compresses, and absolute repose of the organ.

SCLERITOMY IN THE TREATMENT OF GLAUCOMA.

DR. NICATI (*Annales d'Oculistique*, tome cx., 3me livr. iv.) again calls attention to the value of the procedure he has designated by this name. He finds the results remarkably favorable in the treatment of staphyloma consecutive to necrosis of the cornea, and also in the prevention of this condition. He finds also that it deserves an important place in the treatment of certain secondary glaucomas, but not in primary or essential glaucoma.

The operation is done with a straight lance-shaped knife or broad needle, which is plunged through the conjunctiva, sclera, and iris, until an incision of three or four millimetres has been made, or with the scleratome of Wecker directed toward the centre of the eye. The operation is repeated if the increased tension reappears, generally several times with some weeks' interval.

OTOLOGY.

UNDER THE CHARGE OF

CHARLES H. BURNETT, A.M., M.D.,
AURAL SURGEON, PRESBYTERIAN HOSPITAL, ETC., PHILADELPHIA.

ACUTE SUPPURATIVE OTITIS MEDIA.

DR. GORHAM BACON, in the *New York Eye and Ear Infirmary Reports*, January, 1893, describes a case of acute otitis media in which it was necessary to perforate both mastoid processes, and in which there was a further complication of typhoid fever; entire recovery took place. The case is consequently one of interest on account of the unusual complications and the difficulties presented in making a diagnosis and prognosis. The patient was first seen on June 1, 1892, and treated for his ear disease. He was discharged July 13th from the hospital. Although the ear symptoms had almost entirely disappeared on August 4th, he presented himself at the hospital complaining of pain in the abdomen. He was readmitted to the infirmary, and on August 13th a diagnosis of typhoid fever was made. By September 12th he was discharged, cured. The difficulties of diagnosis in this case presented themselves in the early stage after the second operation, because the natural inference was made at that time that there was a collection of pus in the cranial cavity in consequence of the ear disease, and the advisability of a further operation in this region was earnestly discussed. It was even supposed at a later period when a third operation was performed on the mastoid, that the patient might have typhoid fever, and, in fact, it was considered at the time of his readmission to the infirmary that he was in reality suffering from a relapse of typhoid fever.

FURTHER NOTES ON REMOVAL OF THE STAPES.

DR. F. L. JACK, in the *Boston Medical and Surgical Journal*, of January 5, 1893, continues his contributions to the history of this operation. He says the practicability of this procedure on the human subject has now been fully demonstrated by several observers, and its value in many cases fully proven. No claim is made that it will help all cases, but it surely does some. In cases of otitis media suppurativa, after the otorrhœa has ceased the incudo-stapedial joint is firmly fixed by bands of adhesions. This condition of the bone offers a mechanical hindrance to the transmission of sound waves to the vestibule. Relieving this obstruction by removal of the stirrup is found to increase the hearing power for the voice very materially.

Another set of cases is very similar pathologically, namely, otitis catarrhalis adhesiva. There is proliferation of tissue with ankylosis of the ossicular chain. Here, again, good results by removal of the bone have been demonstrated.

There is a third class, namely, otitis media insidiosa (sclerosis), in which it is generally believed that the ankylosis is not fibrous but osseous. This

condition is usually characterized by a high degree of deafness and tinnitus. The appearances of the membrana tympani are said to be either normal or nearly so. Judging from a further experience with this troublesome condition, the region of the foot-plate would appear to be the principal seat of the bony ankylosis according to Dr. Jack. It is needless to say that diseases of the internal ear are not affected by this operation. It must be carefully determined beforehand, therefore, in each case, by special tests, whether the impairment in hearing is due in part or wholly to changes in the labyrinth,

A matter of considerable interest in the removal of the stapes is the effect of its removal on the labyrinth. Theoretically, there should be a general disturbance; practically this is not the case. The symptom vertigo was carefully searched for, but was found in one case only, that of a woman forty-seven years old. Dizziness, however, was an old complaint with her, and was very likely due to dyspepsia. In a few cases, vertigo, which was complained of before the operation, entirely disappeared.

It does not seem from the statements in this paper that the improvement to hearing by the removal of the stapes was marked. In no case did it appear to be injured.

EXPLORATORY OPENING IN THE TYMPANUM AND SUBSEQUENT OPERATIONS IN THE MIDDLE EAR WITHOUT GENERAL ANÆSTHESIA.

DR. CLARENCE J. BLAKE, in the *Boston Medical and Surgical Journal*, April 20, 1893, communicates his views upon the above-named subject. He says:

"In view of the recent advances in the surgery of the middle ear, and especially in those cases of chronic non-suppurative middle-ear disease where operation is undertaken for the improvement of the hearing, and in which the exact determination of the character and location in the sound-transmitting apparatus of the obstacles to the passage of the sound-wave is a matter of difficulty, the question of some method of exploratory operation which shall avail of the intelligent participation of the patient has become a matter of considerable importance. It is claimed that an incision in the membrana tympani begun opposite the round window causes increasing pain as it is extended upward and forward along the periphery."

Notes are then given of operations on the membrana tympani and within the drum-cavity. Dr. Blake concludes:

1. That general anæsthesia is not necessary in all cases to the successful performance of operations upon the membrana tympani, nor within the middle ear where these are undertaken in chronic non-suppurative disease for the purpose of improving the hearing.

2. That local anæsthesia by means of cocaine in very small quantity is sufficient.

3. That the exploratory opening of the tympanic cavity, and, if deemed necessary, subsequent operations within the middle ear, in the line of the sound-transmitting apparatus, when done under conditions of local anæsthesia which permit of the conscious and undisturbed co-operation of the patient, afford decided advantages for purposes both of diagnosis and treatment.

4. That when preceded and accompanied by proper antiseptic precautions,

and concluded by a closure of the opening in the membrana tympani with similar care, the danger of subsequent suppurative inflammation is very slight.

OBSTETRICS.

UNDER THE CHARGE OF

EDWARD P. DAVIS, A.M., M.D.,

PROFESSOR OF OBSTETRICS AND DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC;

CLINICAL PROFESSOR OF DISEASES OF CHILDREN IN THE WOMAN'S MEDICAL COLLEGE;

CLINICAL LECTURER ON OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE;

VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.;

ASSISTED BY

WILLIAM H. WELLS, M.D.,

ASSISTANT DEMONSTRATOR OF CLINICAL OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE,

PHILADELPHIA; CLINICAL ASSISTANT TO THE CHAIR OF OBSTETRICS AND

DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC.

A FŒTUS WITH VARIOUS DEFORMITIES APPARENTLY DUE TO ADHERENT AMNION.

MACPHAIL (*Glasgow Medical Journal*, 1893, No. 2) reports the case of a woman in her sixth pregnancy. The patient had been bleeding continuously, but not severely, for eight weeks; her previous children were born prematurely, but all lived. All previous labors had been normal, but the puerperal periods following had been long and severe. When seen by the author the fœtus was lying loose in the vagina, with the placenta, which was entire, about two and a half inches in diameter, very thin, of a yellow color and greasy appearance. The uterus was both anteverted and anteflexed, the os being high and directed backward. Examination of the fœtus showed it to be about three and a quarter inches in length, soft, and macerated. The head appeared normal in size and shape, the eyes being normal in situation, but covered in by an integument which was continuous over the whole head, but through which the orbital outlines and palpebral fissures could be seen. There was deficiency of development of the nose and ears. In the nascent state the mouth was covered in by a thin membrane, continuous with that which covered the rest of the head, but which stripped off that part easily. Except a small area over the occiput, the membrane over the head was firmly adherent. The body was normal in shape, the outlines of the various portions being visible through their coverings. The upper right limb was fairly normal in shape, but the forearm appeared dislocated forward at the elbow-joint; the hand was abducted to a right angle at the wrist and had no thumb, but four fingers, of which the outer two were short and stumpy, and all were webbed. The left arm was of normal length, but with the elbow projected forward. Similar deformities appeared in the lower limbs. The feet were represented by one small shapeless mass, into which both legs were continued, no division line between them appearing.

No sign of an anus could be seen, but anteriorly there were parts which resembled a vulva. From this description the author believes there can be little doubt that the case is one of adherent amnion.

A CASE OF SYMPHYSIOTOMY IN AN EXTREMELY CONTRACTED PELVIS;
CRANIOTOMY; RECOVERY OF THE MOTHER.

DIMMOCK (*British Medical Journal*, 1893, No. 1695) reports a case in which symphysiotomy was done on a Hindoo rhachitic dwarf. The patient was found on admission to be a weakly, pale, emaciated woman, four feet three inches in height. The uterus was globular in shape, and fell over the symphysis to a considerable extent. The pelvis was diminutive, the external measurements being: between crests, $8\frac{1}{2}$ inches; between spines, 8 inches; intertrochanteric, $8\frac{1}{2}$ inches; external conjugate, 6 inches. The pelvic opening at the brim was a mere slit, so that the point of the finger could alone enter it. No fœtal heart-sounds could be heard. Symphysiotomy was decided upon on account of the patient's exhausted condition, which rendered the more serious operation of Cæsarean section inadvisable. After section the bones sprang apart about one and a quarter inches; the fœtus was found presenting by the vertex. As the hand could not be passed through the brim without using dangerous force, and the amount of room gave no hope of successful version, it was determined to do craniotomy. The head was perforated, and extraction effected after cranioclasm by the craniotomy forceps.

Before operation the horizontal rami of the pubes were in close approximation, so that the shape of the opening at the brim was in the form of a triangle; but when the joint was cut through they separated, and the conjugate diameter then measured about two and a quarter inches. An Archimedean drill was used, but the bone was so soft that the wound had to be brought together by means of wire sutures passing deeply and close to the bone, with superficial sutures between them. Drainage was used. The patient made a good recovery, and at the time of her discharge from the hospital could walk well. The symphysis united firmly.

INSUFFLATION IN THE NEWBORN.

BUDIN (*Archives de Tocologie et de Gynécologie*, 1893, No. 7) distinguishes two varieties of methods for insufflation—the direct and indirect.

Among the former he classifies: 1, Sylvester's; 2, Schultze's, but neither is sufficient when there is a mucous plug in the air-tubes.

In the latter list the writer mentions: 1, mouth-to-mouth insufflation; 2, by means of the tubes of Chaussier and Depaul; 3, insufflation with the tubes of Ribemont.

1. Mouth-to-mouth insufflation. The lips are applied to those of the child and the mucus blown from the throat by way of the anterior nares. It is doubtful if any air goes to the lungs, because of the flaccidity of the air-passages. Should it do so, it drives before it the viscid matter, which will obstruct a certain number of bronchi.

2. By means of the tubes of Chaussier and Depaul. This instrument pre-

sents some inconveniences: both hands are required for closing the nose and mouth, consequently neither is free to support the child's breast and make the air come out completely; moreover, with but one hand it is impossible to practise perfect aspiration.

3. The instrument of Ribemont is excellent for many reasons: it is easy of introduction, requires but one hand, leaving the other free, thus permitting the aspiration of mucus contained in the trachea and lungs.

Any instrumental insufflation is often very difficult; it is a true catheterization. Frequently strong aspiration through Ribemont's tube is necessary in order to draw out the mucus and allow the air to enter the lungs.

THE INFLUENCE OF CORSETS UPON THE INTERNAL ORGANS OF WOMAN.

ROSENBACH (*Der Frauenarzt*, 1893), in an article of considerable length on the subject mentioned above, says that while he admits that in a certain number their use seems to be productive of no ill results, yet this is not the case with the greater number of women. All hollow organs require room for the proper performance of their functions, and this the corset prevents. Especially are they injurious to those who labor with their hands, such as workers with sewing machines, and others who require free bodily action.

A CASE OF A MONOSOMATOUS MONSTER.

ROUXEAU (*Annales de Gynéc. et Obstét.*, 1893, tome xl.) states that monosomatous monsters consist of double monsters with but one body. In the case reported the fetus, a female, was in good condition, was not macerated, and had entered upon the ninth month of gestation. It is perfect except the head, the form of which is bean-like, placed on a flat anterior hilum. The base of the face is almost perfect. About 2 cm. from the root of the nose a small trunk can be seen, which from its rudimentary nostrils is evidently a second nose. Above the trunk, and at the bottom of a fairly large depression, can be found a cavity, slightly marked, bordered by a badly defined circular fold, evidently a conjunctival cavity containing an eye, which had been detached and extruded during the digital examination at the labor. Further back, just at the culminating point of the head, and on the limit of the hairy scalp, is a pedunculated tumor which, by its connection with the head and by its internal anatomy, seems to be a degenerated and distended ear.

The face is normally conformed, save the superior maxillary and orbits.

There are manifestly two crania, right and left, being so displaced that the median, frontal, and sagittal sutures are directly continuous with each other. The orbital vaults are opposed in their concavity, and reunited so as to form a median orbit of the diameter of a two-franc piece. There is a double optic canal. The sutures and fontanelles are widely open. Spine, straight on the left side, but the development here has been arrested above the fourth vertebræ, due to exaggerated flexion while *in utero*. The brain was completely destroyed by craniotomy and forceps delivery. The author has introduced a number of most excellent illustrations in his report of the above case.

GYNECOLOGY.

 UNDER THE CHARGE OF

 HENRY C. COE, M.D., M.R.C.S.,
 OF NEW YORK.

TREATMENT OF INOPERABLE CARCINOMA OF THE UTERUS.

BERNHART (*Centralblatt für Gynäkologie*, 1893, No. 39) has obtained highly satisfactory results from parenchymatous injections of salicylic acid in alcohol (6 parts of the acid and 60 parts of the alcohol). About thirty minims are injected into the neoplasm in eight or ten different places. Some patients complained of severe pain during the injections, while others had none at all. There were slight elevations of temperature. The results observed were as follows: Within three days after ulcerating nodules had been thus treated the ulcerations had healed and there was marked retraction at the sites of the punctures. After repeated injections (at intervals of four days) the affected nodules had greatly shrunk and presented a smooth surface on which epithelium later developed. Meantime the patient's general health improved, pain and foul discharges ceased, and there were no further hemorrhages. These results were obtained in six cases of inoperable carcinoma of the cervix, though the patients had not been kept under observation long enough to report as to their subsequent condition.

 GASTRO-INTESTINAL DISTURBANCES IN PELVIC AFFECTIONS.

THIELBLER (*Centralblatt für Gynäkologie*, 1893, No. 41) divides these cases into four classes, viz.: 1. Those in which the pelvic trouble is merely secondary, and no connection can be traced between the two. 2. Those in which both are due to a common cause, such as simultaneous displacements of the kidneys and uterus from general muscular relaxation. 3. Intestinal disturbances, leading to pelvic troubles, such as metrorrhagia, dysmenorrhœa, etc., from coprostasis. 4. Pelvic disease may be the direct cause of atony of the stomach and intestines, periodical gastralgia, etc. The writer denies that there is any distinct form of "uterine dyspepsia."

 ERYSIPELAS AND GONORRHOEA.

SCHMIDT (*Centralblatt für Gynäkologie*, 1893, No. 39) reports a case of gonorrhœal vaginitis in a little girl in whom erysipelas of the thigh developed with simultaneous disappearance of the vaginal discharge. Vaginitis is known to be a peculiarly intractable affection in children, yet in this instance it was cured within a few days without local treatment, and there was no recurrence after disappearance of the erysipelas. The apparent causal relation between the latter and the cure of the gonorrhœa is analogous to the effect of the inflammation in cases of inoperable sarcoma.

CONSERVATIVE TREATMENT OF CHRONIC INVERSION OF THE UTERUS.

KÜSTNER (*Centralblatt für Gynäkologie*, 1893, No. 41) describes an operation of which the details are as follows: A transverse incision is made into Douglas's pouch, and the finger is passed through it into the funnel-shaped cavity formed by the inverted uterus; any peritoneal adhesions can be separated at the same time. The posterior wall of the uterus is then incised longitudinally in the median line from the fundus through the os externum. The organ is then reinverted by pressure with the thumb, while the index finger is kept within the funnel. After replacement, the wound in the uterine wall is closed from the peritoneal side with deep and superficial sutures, and, finally, the wound in the posterior fornix is sutured. In a case thus treated the result was highly satisfactory, the hemorrhage being moderate.

HÆMATOSALPINX DUE TO GENITAL ATRESIA.

MEYER (*Deutsche med. Wochenschrift*, 1893, No. 39) mentions the following indications for cœliotomy: 1. When hæmatosalpinx is recognized, especially in cases where the atresia is situated high up in the genital tract. 2. In cases in which enlargement of the tubes is detected in patients with congenital atresia who have severe disturbances at the time of the menstrual period. 3. When after evacuating retained menstrual blood tumors can still be made out which may be regarded as distended tubes that cannot discharge their contents into the uterus; even if only one tube is affected, it is better to remove the adnexa on both sides in order to prevent future trouble. The hæmatometra may then be left undisturbed if it cannot be reached from below; supra-vaginal amputation of the affected uterus is an unnecessarily severe procedure.

GONOCOCCI IN PROSTITUTES.

LASER (*Deutsche med. Wochenschrift*, 1893, No. 37) gives the results of bacteriological examinations in six hundred prostitutes. Gonococci were found in the cervical discharges in twenty-one patients who presented only slight clinical symptoms. In only seven out of one hundred and eighty cases were cocci found in the vagina. Out of three hundred and fifty-three patients whose urethræ were examined cocci were found in one hundred and twelve, although in four-fifths of these there was no macroscopical evidence of gonorrhœa. Several patients had been discharged as cured. In two hundred and forty-one patients in whom no gonococci were discovered there was more or less inflammation of the mucosa, often with a suspicious discharge.

The writer infers that purulent vaginal and uterine discharges may be caused by other micro-organisms than gonococci; it is possible that the latter may either be present in such small numbers as to escape detection, or may have undergone degeneration. He thinks that a systematic microscopical examination of the secretions should be made, especially in chronic cases.

As regards the reputed sterility of this class of women, the writer found that out of forty-four who were especially questioned on this point, all but eighteen had had from one to nine children.

PÆDIATRICS.

 UNDER THE CHARGE OF

 LOUIS STARR, M.D.,
 OF PHILADELPHIA;

ASSISTED BY

 THOMPSON S. WESTCOTT, M.D.,
 OF PHILADELPHIA.

DERMOID CYST OF THE MOUTH.

BLOCH (*Prager med. Wochenschrift*, 1893, No. 28, p. 344) records an interesting example of this formation, which was removed from the mouth of a newborn infant by efforts at cleansing. It measured four centimetres by two, and was flattened in the shape of the head of a frog, slit transversely at its free extremity, and having the color of the buccal mucous membrane. Microscopical examination showed that the tumor was composed of an epidermic layer, of a non-papillary chorion, and contained hairs, sebaceous glands, and abundant adipose tissue. It had been attached at the posterior part of the left half of the palatine roof close to the median line. The uvula presented a complete central cleft.

A CASE OF GASTRORRHAGIA IN A NEWBORN INFANT.

AN interesting case of gastric hemorrhage, occurring on the first day after birth, is reported by LORANCHET (*Gazette hebdomadaire de Médecine et de Chirurgie*, 1893, No. 37, p. 436). The vomiting of blood had first occurred about twelve hours after birth, and was frequently repeated in the following twelve hours. The external treatment consisted of frictions with camphor and whiskey, artificial heat, and complete envelopment with warmed cotton wool. Seltzer and sugar water, with a few spoonfuls of coffee, were first given internally, followed by finely pulverized ice covered with milk, a teaspoonful hourly. Minute doses of perchloride of iron were soon added to this treatment, as the stools showed a continuation of the hemorrhage. The child recovered.

The author attributes the hemorrhage to exposure to cold—a cause which he finds is not mentioned by any other writers upon the subject. By this term he understands not brisk chilling of the surface, but slow, progressive, and almost imperceptible refrigeration. In this form cold acts as a general debilitant and depressant of the nervous system; the general circulation is disturbed, the peripheral circulation slowed, the vasomotor system unbalanced. The substitution of the cardio-pulmonary cycle of the newborn for the splanchnic cycle of the fœtus is interfered with, and in this struggle of reflexes there is a reversion to the splanchnic cycle with passive congestion of the gastro-intestinal mucous membrane which gives rise to hemorrhage.

In regard to treatment, the necessity of promptness and energy is em-

phasized. In the statistics of Barthez and Sanné, out of 23 cases 11 died, 9 of them very quickly. The author condemns expectant treatment, and advises a fearless employment of ice and astringents.

TREATMENT OF CHOREA AND ENURESIS BY INJECTIONS OF TESTICULAR EXTRACT.

DEYDIER (*Lyon Médical*, 1893, No. 16, p. 548) publishes five observations of chorea and three of nocturnal incontinence of urine in children treated by this method. In one case of chorea the improvement was almost instantaneous, and cure was complete after seven injections. In three other cases improvement was observed after the third injection, but cure was not attained until after three weeks or a month of treatment. The fifth case was absolutely rebellious to treatment.

In the cases of enuresis, with one child each injection prevented the incontinence during the night following the injection, but on that night only. In another case, a child of five years was radically cured by one injection and the dread of a second. Finally, a third child was seized shortly after the injection with alarming nervous symptoms (fainting, abdominal pains, vomiting) and the operation was not repeated. The child remained eight days without wetting the bed, and then recommenced it. In all the cases of incontinence suggestion or fear appeared to play an important part.

Except in the single instance mentioned, all the patients bore the injections well. The dose was one half a cubic centimetre. Only a little pain and inflammation at the point of puncture was noted.

PURPURA AFTER VACCINATION.

EPSTEIN (*Jahrb. f. Kinderheilk.*, 1893, Bd. xxxv. p. 442) records two cases of this kind in a study of the complications of vaccinia. Both cases occurred in infants under four months of age, the first of whom was rhachitic. The hemorrhagic patches of variable dimensions appeared four days after vaccination, their appearance being preceded by agitation, insomnia, and fever. With the first the lesions occupied exclusively the left arm, especially the extensor aspect; with the second they were seated upon the members and the trunk. They persisted for eight days, passing through the usual variations of color. In both cases the vaccination took perfectly, but the contents of vesicles and pustules was never hemorrhagic. In the case of the first infant, five days after the purpura began, measles of non-hemorrhagic character made its appearance, the lesions remaining distinct from the purpuric patches.

In comparing these two cases with the five published by Pfeiffer, the author found that in all the cases the purpuric eruption appeared from the fourth to the eleventh day after vaccination, that its onset was preceded by such symptoms as agitation, insomnia, and fever, and absorption of the blood took place in from six to eighteen days. The author's cases, however, differed from Pfeiffer's in the absence of blood in the vesicles, which had been the first sign of hemorrhage in all the cases of the latter observer; in the absence of hemorrhages from the mucous membranes, and in the more discrete disposition of the lesions.

HYGIENE AND PUBLIC HEALTH

UNDER THE CHARGE OFEDWARD F. WILLOUGHBY, M.D.,
OF LONDON;

AND

CHARLES HARRINGTON, M.D.,
INSTRUCTOR IN MATERIA MEDICA AND HYGIENE, HARVARD MEDICAL SCHOOL.

FLIES AND DISEASE.

SURGEON-GENERAL SIR WILLIAM MOORE (*Medical Magazine*, July, 1893) regards the dissemination of diseases by flies as a matter looked upon with too much indifference, and instances an epidemic of anthrax which was spread by flies which had covered the carcass of a dog thrown into a ditch in Cortal. He quotes the experiments of Sawtschenko with flies and cholera germs, and observes that it is worth noticing that in India it is during the time and season of the greatest prevalence of cholera that flies most abound. The possibility of flies carrying the organisms of typhoid and phthisis is suggested, and the belief is expressed that leprosy is often conveyed by flies which appear to be particularly fond of leprosy sores and of investigating anything in the way of a sore on a healthy person.

There is no doubt that ophthalmia is so spread, and an instance is given of complete destruction of an eye from diphtherial inflammation following a sting in the eye by a fly which had apparently risen from a dunghill. That venereal disease is not more frequently disseminated by flies is probably explainable by the fact that the sores are usually on unexposed parts of the body.

ACTION OF COLD ON CHOLERA BACILLI.

AN outbreak of cholera occurred in the insane asylum at Nietleben, in the beginning of 1893, at a time when the temperature was twenty degrees and more below zero, Centigrade, and all the rivers were frozen. To determine whether the bacilli would die or be preserved in the ice, a series of experiments was undertaken by PROF. RENK, of Halle (*Fortschritte der Medicin*, May 15, 1893). Water from the Saale was sterilized, cooled, inoculated with cholera germs, and frozen; the ice being finally melted, and cultures made. In the first experiment each c.cm. of water contained, after inoculation, 620,000 organisms. The flask was frozen at -9.6°C. , and exposed to that temperature thirty-nine hours. The cultures made from the melted ice were negative in results. A second test with more richly inoculated water kept in a freezing mixture of ice and salt, gave negative results after one day. Sterilized water so inoculated that each cubic centimetre contained countless bacteria, was frozen, and cultures made from the melted ice after forty-eight and ninety-six hours. After forty-eight hours of exposure each cubic centimetre of melted ice yielded 24,400 organisms, but after ninety-six hours the

results were negative in each of twelve tests. Experiments were undertaken with unsterilized Saale water to determine the influence, if any, of the presence of spaltpilze. A number of bottles of the water so inoculated as to contain 1,483,000 organisms to the cubic centimetre were frozen, and on each following day one bottle was taken, the ice therein melted and examined, then re-frozen. It was found that after five days of uninterrupted freezing all the bacilli are killed, and after six and seven days when the freezing is interrupted. The conclusion is that cholera bacilli cannot develop after being in ice eight days.

UFFELMANN (*Berliner klinische Wochenschrift*, 1893, No. 7) had already begun experiments in the same direction before the outbreak occurred at Nietleben, and was able to utilize the intense cold of January. His results show that cholera bacilli have considerable power to withstand cold and that they succumb only after a certain time, the duration of vitality being seemingly dependent on the degree of cold. There seems to be no essential difference in the behavior of entirely fresh or older cultures of the bacilli.

DIPHTHERIA IN LOMBARDY.

DR. FRANCO MISSAGLIA (*Giornale della Reale Società Italiana d'Igiene*, July, 1893), reporting the results of his investigation of an outbreak of diphtheria in Sommo, Lombardy, during the summer and autumn of 1892, states that the spread of the disease is largely due to the prejudices of the people, who conceal sickness, disobey the physician, and throw away his medicines. Among other circumstances highly favorable to the spread of the disease, he mentions the direct contact of children, who, living in common, easily transmit the infecting bacillus; the indirect contact by means of mothers, of female neighbors, and of domestic utensils; the spitting on the floor, or on sheets and counterpanes not subsequently washed; insufficient means of disinfection; washing of clothes of the infected in water which afterward becomes a focus of disease; absence of cleanliness; and bad drinking-water.

LEPROSY IN INDIA.

THE conclusions of the Leprosy Commission (*Indian Medico-Chirurgical Review*, July, 1893) are that leprosy is a disease *sui generis*, not diffused by hereditary transmission; it must be regarded as contagious and inoculable, yet the extent to which it is propagated by these means is exceedingly small. It is not directly originated by the use of any particular article of food, nor by any climatic or telluric conditions, nor by insanitary surroundings; neither does it affect any race or caste. It is indirectly influenced by insanitary surroundings, such as poverty, bad food, and deficient drainage and ventilation, which cause a predisposition and increase the susceptibility of the individual. In the great majority of cases, it originates from a sequence of concurrence of causes and conditions related to each other in ways imperfectly known. Complete segregation has never yet been possible; in India it is absolutely impracticable. The commission are of opinion that the sale of articles of food and drink by lepers should be prohibited, and that they should be prevented from practising prostitution, and from following such occupations as those of barber and washerman.

PATHOLOGY AND BACTERIOLOGY.

 UNDER THE CHARGE OF

JOHN SLADE ELY, M.D.,

PROFESSOR OF PATHOLOGY IN THE WOMAN'S MEDICAL COLLEGE OF THE NEW YORK INFIRMARY;
 ASSISTANT IN PATHOLOGY IN THE COLLEGE OF PHYSICIANS AND SURGEONS; PATHOLOGIST
 TO BELLEVUE HOSPITAL; AND ASSISTANT PHYSICIAN TO THE ROOSEVELT HOSPITAL
 OUT-PATIENT DEPARTMENT.

HEART HYPERTROPHY.

IN the *Johns Hopkins Hospital Reports*, 1893, vol. iii, Nos. 4-6, is to be found an interesting study by W. T. HOWARD, Jr., of the cases of hypertrophy of the heart which came to autopsy at the hospital, from its opening in May, 1889, until October, 1892. The record comprises 360 autopsies in all, and of these 105, or 29 per cent., showed cardiac hypertrophy.

From personal studies, and from a careful consideration of the observations of others, Howard fixes at the outset upon standard measurements of the normal heart, in estimating which, the sex, size and weight of the body, and the condition of the ventricles as regards contraction, are all considered. In this connection the interesting fact is developed that under normal conditions, and in the same race, the size and weight of the heart vary with the locality. Thus the weight of the average Berlin, Munich, London, Paris, and Baltimore hearts differs quite materially.

Howard studies his cases more particularly from the etiological standpoint, considering them under the heads of those resulting from intra-cardiac disease and of those dependent upon abnormal conditions outside the heart. As will be seen by reference to the following table, by far the greater number of the cases belong in the latter category.

Table giving the Relative Frequency of the Conditions producing Heart Hypertrophy.

	Cases.	Per cent.
Arterio-sclerosis in	62	59
Nephritis	14	13.4
Valvular lesions	13	12.4
Adherent pericardium	8	7.6
Work	4	3.8
Tumors	2	1.9
Aneurism of heart wall	1	0.95
Hæmic plethora	1	0.95

It will also be noticed that of the extra-cardiac influences, arterio-sclerosis is by far the most frequent cause of heart hypertrophy, considerably more than half the cases being attributable to this cause alone. When considered in relation to age, the etiological influence of vascular disease is even more striking, for of 59 cases of heart hypertrophy of forty years of age and over, 48 cases, or 81 per cent., were due to arterio-sclerosis, and Howard shows that a

knowledge of these facts may be of great diagnostic importance in the differentiation of doubtful cases. It is also believed that well-marked arterio-sclerosis is a very much more fatal disease than simple chronic diffuse nephritis with compensatory hypertrophy of the left ventricle, for the reason that compensatory hypertrophy is very much more easily produced and kept up in the latter than in the former disease, and in either condition comparative health is enjoyed as long as cardiac compensation obtains. And it is further held that in mechanical obstruction to the circulation, cardiac hypertrophy is to be regarded as conservative and greatly to be desired, and that the amount of hypertrophy present, if the individual is in fair health, may be taken as an index of the gravity of the lesion or lesions causing it.

PERITONITIS CAUSED BY PROTEUS VULGARIS.

It is only recently that pathogenic qualities have been attributed to the proteus group of micro-organisms, but the occasional observation of such cases as the following leaves no further doubt upon the subject. After reviewing the evidence as to the virulence of *Proteus vulgaris*, FLEXNER (*Johns Hopkins Hospital Bulletin*, April, 1893, iv.) reports a case of fatal peritonitis in which that germ was the only organism discoverable in the peritonitic exudate.

The patient was a young woman, eighteen years of age, who died, two days after admission to the Johns Hopkins Hospital, of a well-defined case of acute general peritonitis. At the autopsy, besides the sero-fibrinous exudate of the peritonitis, a chronic diffuse nephritis and a tubercular ulcer of the intestine were discovered. Cultures from the various organs of the body disclosed the presence of *proteus vulgaris* alone in the kidneys and peritonitic exudate; in the lung *bacillus coli communis* was found. As no other cause for the peritonitis was discoverable, Flexner attributes it to the presence of the proteus, and suggests that the lowered tone of the system resultant from the long-continued nephritis, and possibly the previous accumulation of a slight amount of ascitic fluid in the peritoneal cavity, may have afforded the conditions necessary for the pathogenic action of that germ. The tubercular ulcer may have permitted the more ready ingress of the proteus to the peritoneum from the intestine, of which it is a frequent inhabitant.

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All communications should be addressed to

DR. EDWARD P. DAVIS, 250 South 21st Street, Philadelphia, U. S. A.

Or

DR. HECTOR MACKENZIE, 59 Welbeck St., Cavendish Sq., W., London, Eng.

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THE
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FEBRUARY, 1894.

FOUR CASES OF BRAIN TUMOR, IN THREE OF WHICH
OPERATION WAS DONE—TWO OPERATIVE RECOV-
ERIES—ULTIMATE DEATH IN ALL.

BY W. W. KEEN, M.D.,

PROFESSOR OF THE PRINCIPLES OF SURGERY AND OF CLINICAL SURGERY,
JEFFERSON MEDICAL COLLEGE.

(Concluded from p. 52.)

CASE III.—*Supposed cerebellar tumor; operation; death; glioma found in floor of third ventricle.* S. L. S., aged fourteen years six months. Seen in consultation with Drs. S. Weir Mitchell, D. D. Stewart, H. C. Wood, C. A. Oliver, and Morris J. Lewis, February 26, 1889.

Dr. Stewart has kindly furnished me with the following facts in the case: "There is no history of tuberculosis on either side, excepting in the paternal grandfather, who died at the age of fifty-three, with supposed tuberculosis pulmonum. No specific history in the parents. His mother has had no miscarriages. The boy's head has always been large since birth. He has been ailing since the summer of 1888, but attended school until November of that year. He then first noticed headache, which was chiefly frontal. In November he had nausea and vomiting for about a week, without convulsions. His eyesight has failed until he cannot read unless the print is large. Not uncommonly he has nausea on rising in the morning. There is no ankle clonus. The knee-jerks, especially the right, are exaggerated."

January 19, 1889. There has been a gradual increase of vertigo and vomiting, with unsteady gait. Headache is slight. For six weeks the urine has passed involuntarily. He eats inordinately. He can walk forward and backward as well without as with the guiding sense of vision, but his gait is undoubtedly unsteady. His pupils are dilated and react to light, the right less than the left, and the right is permanently larger than the left, both in shadow and in bright light. There is double optic neuritis. His intellect is dull and his movements slow. Temperature normal, pulse rather irregular, the right being

somewhat the stronger. Hearing, smell and taste are normal on both sides. Tactile sensation is everywhere normal. Urine: sp. gr. 1020; no albumin; no sugar. He is taking iodide of potassium.

29th. He vomited the entire day on the 25th without any nausea, the vomited matter containing a little blood.

February 8th. He is somewhat brighter, and can follow conversation connectedly. A tendency to fall backward and to the left when walking is now very pronounced, especially as soon as he becomes tired. The backward tendency is most marked on halting or turning. In walking or sitting there is also a marked tendency to stoop, with his head and shoulders thrown forward. He still has no control over the bladder. He is markedly constipated. There is objective vertigo, the movements being always in a reverse direction to the hands of a watch. Occipital temperature, on the right side, 96.5° ; on the left, 95° . Hard percussion over various parts of the head and especially the occiput elicits no tenderness.

13th. He had severe vomiting all day on the 9th, without having taken any iodide to account for it. Occipital temp., right, 94.8° ; left, 96° ; the thermometer being held by a strap to the head for eight minutes.

19th. All the morning of the 17th he had again continuous vomiting, and in the afternoon was dull and stupid. This continued during the next day, the 18th, on the afternoon of which he was delirious. His sight is steadily failing and his gait has become more uncertain. He cannot take even two or three steps without stumbling, and with a decided tendency to fall to the left. His stumbling is due to the fact that he does not lift his feet, but drags his toes, yet in a sitting posture he can flex and extend the feet. Over the left occipital bone the percussion note seems to be decidedly tympanitic, as though air were beneath it.

25th. He has been unusually dull for the past week. His head seems to have increased somewhat in size since I first saw him. The veins of the head show very distinctly. Yesterday the head was shaved and a consultation held with Dr. S. Weir Mitchell. Evidently the boy was sinking, his sight having entirely failed and the tendency to coma being marked. His gait had grown exceedingly uncertain. His body was rigid and his neck muscles stiff. The scalp shows two slight scars on the upper occipital region. They are said to have been present from early boyhood. No symptoms seem to be due to them. The scalp temperature was carefully taken, Séguin's thermometer being used. The thermometer was carefully held in place with equable pressure until it entirely ceased to rise. The smaller number indicates the higher temperature.

						Right.	Left.
No. 1.	Occipital	.	.	.	.	—3	—3
No. 2.	Occipital	.	.	.	.	—3	—2
No. 3.	Occipital	.	.	.	.	—2	—2
No. 4.	Parietal	.	.	.	.	—4½	—3
No. 5.	Bregmatic	.	.	.	.	—2	—3
No. 6.	Rolandic	.	.	.	.	—3	—3½
No. 7.	Frontal	.	.	.	.	—6½	—5
No. 8.	Frontal	.	.	.	.	—4	—4

26th A consultation was held with the gentlemen already named. The following measurements were taken by Dr. Keen: Circumference of the head, $22\frac{5}{8}$ inches. When the halves were measured separately a slightly different measurement was obtained, the right measuring

11 $\frac{1}{2}$ inches, and the left 11 $\frac{1}{2}$ inches, the difference in total circumference being evidently an error of measurement. From the glabella to theinion measured 14 inches.

My own opinion was, by exclusion and presence of a few signs, that there was probably a tumor in the middle lobe of the cerebellum, growing into the right lobe or, at all events, exerting pressure upon it. There seemed to be absence of signs implicating other parts of the brain. The ataxic gait, with a tendency to fall backward and to the left, marked double optic neuritis, signs of ventricular distention, stupor, the last being relieved by free purgation and digitalis, all pointed to the presence of cerebellar tumor. On the whole this diagnosis was accepted at the consultation, although not without some doubts, especially by Dr. Wood, who was himself disinclined to operation. As, however, without operation the boy had absolutely no chance, and operation, although giving a small chance only, was the one possible means of escape, it was accordingly decided to recommend an operation."

Dr Chas. A. Oliver reported on the ocular condition as follows:

"The patient was first seen on the 27th of February, 1889. In August of the previous year his eyes were examined for glasses by a physician who stated that the retinae were temporarily 'clouded,' and that this was dependent upon local disturbance. Dating from October of the same year, sight was gradually lessened; this defect of vision being associated with sudden attacks of blindness—the last one having occurred on the evening before the examination. The patient claimed that the sight of the left eye had always remained the better.

"At the time of the examination the pupillary areas were equally and evenly dilated to 6 mm. each, except at four minute points caused by narrow posterior synechiæ. In the left eye there were two small posterior synechiæ situated up and in and up and out, the former being the larger. In the right eye there were two narrow similar tags situated down and in. Intra-ocular tension was normal in each eye.

"Although vision was reduced to the faintest light-perception in each eye, a typical left homonymous hemianopia could be readily determined by careful study with two candle flames, the double bow at the macular portion of the remaining fields of vision being easily obtained. The retained area of the field of the right eye was about one-fifth larger than that of the remaining field of the fellow eye.

"Ophthalmoscopically, there was a pronounced choked disk on both sides, this being the greater on the right side (three dioptries as compared with two and one-half dioptries in height). The tissues of the swollen nerve-heads were undergoing atrophic changes, these having advanced to a greater degree to the temporal halves in each eye, and having become more pronounced in the left eye. On both sides the surrounding retinal oedema was confined to narrow areas around the disks. In the right eye, numerous capillary feathery hemorrhages extended in the fibre layer of the retina, this being accompanied by a number of fine cholesterin crystals and clump-like extravasations in the substance of the nerve-head swelling. To the outside of the right disk, and seemingly fixed, there was a rounded whitish amorphous-like mass which extended as far forward into the vitreous as the swollen disk itself. Both macular regions seemed to be devoid of any gross pathological changes. The retinal arteries and veins were diminished in size, especially the arteries, they being the more reduced in the left eye.

"With the exception of a slight paresis of the left inferior rectus muscle, the action of the extra-ocular muscles seems to be intact.

"Repeated studies for the production of the hemianopic pupillary inaction sign, after proper and prolonged periods of rest and exposures to narrow pencils of peripherally situated beams of concentrated artificial light, seemed at times to evidence this special sign (especially in the right eye), but just as frequently failed to show anything that was characteristic. Sometimes, however, the irides, which were tied down to the anterior capsules at their most important places by narrow pigment tags, seemed feebly to respond to light-stimulus when thrown from any portion of the periphery.

"The ocular symptoms (which were far advanced before any proper ophthalmic study was permitted, and only after the motor groupings had become quite vague, confusing, and almost valueless) were markedly significant of a gross intra-cranial lesion situated in the posterior base, causing both ventricular and basilar pressures and extravasations, which were very marked on the right side.

"Evidently, by reason of the easy fatigue of the patient, the almost complete blindness (faint light-perception alone in the remaining half-fields), the pronounced pupillary dilatation, the almost infinitesimal and interfered-with movements of the irides, and the necessity of beams of strong light-stimulus from the very imperfect apparatus then in use to produce any movement at all (thus at times producing strong side glares of diffused light), the Wernicke sign was so uncertain as to render this important localizing symptom to be conscientiously negatived.

"For these reasons, the sudden attacks of almost total blindness, with the intense double optic neuritis, the retinal and iridic evidences of probable tuberculous deposition, in association with the general symptoms of cerebellar lesion, made probable the existence of a similar mass in that situation. This tumor, pressing forward on the fourth ventricle, could thus give rise to internal hydrocephalus with consequent disturbance of the nuclei of the left inferior rectus and both iris muscles, and allow extravasations of infected lymph into the sheaths of the second nerve, thus producing peripheral inflammation in the optic nerve-heads and circumjacent retinæ; and finally it could thus indirectly produce upward, inward, and forward pressure against the basilar ganglia and outgoing nerve strands, so as to produce the right tract lesions and the series of doubtful sensory-motor arc disturbances.

"NOTE.—From the results of more recent studies of similar cases it is quite certain that had this case been studied earlier, the ocular symptoms would have been so sure and so easy to differentiate, that almost positive assertion as to the exact position of the intra-cranial neoplasm, as found post-mortem, could have been vouchsafed by the ophthalmic signs alone."

Operation at St. Agnes Hospital, March 2, 1889, by W. W. Keen.
Pulse normal—85. At beginning of operation, under ether, it rose to 120. A reversed U-shaped incision was made from just over the right mastoid process down into the muscles of the neck, terminating an inch above and to the left of theinion. The incision was rapidly carried deep into the muscles, and the flap turned down. Very abundant hemorrhage took place from a large number of vessels, requiring a great many hæmostatic forceps. Two small vessels emerging from the bone on each

side of the occipital crest were exceedingly troublesome. They could not be caught with forceps; plugging with disinfected matches was not effective, but they were finally controlled by the Paquelin cautery. The muscles below the flap were now scraped off the bone until the foramen magnum and the sheath of the cord were easily seen and felt.

The centre pin of a three-quarter inch trephine was now applied, as suggested by Mr. Lloyd (*Lancet*, October 1, 1888) at a point midway between theinion and the tip of the mastoid. A few turns of the trephine sufficed to penetrate the bone, which was so thin that the centre-pin penetrated the dura before a groove was cut into the bone sufficient to allow of the withdrawal of the centre-pin. When the button of bone was removed a jet of cerebro-spinal fluid spurted through this small opening in the dura to a distance of several inches. The opening in the bone was now easily enlarged in any direction until it reached within a half-inch of the groove for the lateral sinuses and the same distance from the foramen magnum. Internally it reached to a quarter of an inch of the middle line, and externally almost to the lateral sinus again. Escape of the fluid made the dura somewhat loose, so that tapping on it caused it to flap to and fro, and the same effect was caused by pulsation of the brain. In fact, this motion at the upper border of the opening at one time caused me to think that it was a venous pulse in the sinus. When the cerebellum was exposed by a flap with the base upward toward the sinus its appearance was healthy. There was slight œdema of the pia. To the touch the cerebellum seemed soft.

The little finger was now passed over the entire upper surface of the cerebellum, and the tense tentorium was felt. The projection of the middle lobe was moderately appreciable. Below the cerebellum the same sweep of the little finger showed nothing abnormal. No appreciable vessels were felt passing from the cerebellum to the tentorium, but each time on withdrawal of the finger a considerable gush of venous blood followed. This, however, ceased spontaneously. The cerebellum was now incised posteriorly, and the little finger introduced gently into it internally to a depth of an inch and three-eighths. This caused the pulse, which had risen to 164 on exposing the brain, to rise suddenly to 184 at the time of the incision and manipulation of the cerebellum, but in half a minute to fall again to 160. No tumor was found after most careful and gentle search. The wound in the dura was closed by sutures, and the external wound, after suitable drainage, was closed by a number of deep sutures through the muscles, as well as by a few superficial sutures.

The operation lasted for nearly an hour and a half, the greater portion being taken up by the obtaining of a dry field for operation before the brain was opened, and by the closure of the dura and the external wound after the operation proper was terminated.

The patient was placed in bed surrounded by hot bottles, his pulse being 156 and of very fair strength. He recovered consciousness and recognized his father and the resident, speaking to them rationally.

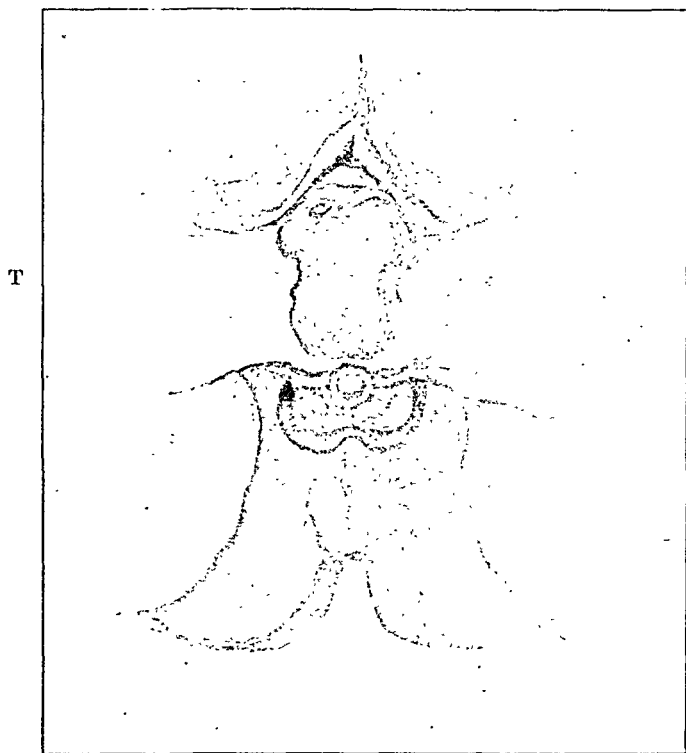
After a few hours he was attacked with rigidity of the muscles and universal tremor. Horizontal nystagmus was very marked. He gradually sank, and died nine hours after the operation was completed.

Post-mortem by Dr. William J. Taylor. Skull: Over the parietal eminence and in several other places it was elastic and depressible, but not papyraceous. It was very thin at all points, so that a few strokes of

the saw penetrated the interior. The sutures were widened but the bones not separated. It was a typical hydrocephalic skull. There was a very small cord-like post-mortem clot in the right lateral and superior longitudinal sinuses, none in the straight sinus. The Pacchionian bodies were normal.

On inspecting the base of the brain the floor of the third ventricle presented a marked hemispherical projection, producing pressure on the optic tract and chiasm, and to a less extent on the optic nerves. (Fig. 5.)

FIG 5.



Tumor (opposite T) in the floor of the third ventricle. (Drawn by DR. J. MADISON TAYLOR.)

The optic tracts and the chiasm were attached to the tumor, and the tracts were spread out into bands on the right and left sides respectively, 12 to 10 mm. wide. The chiasm also was flattened. The angle of divergence between the crura cerebri was increased. The fourth ventricle was not distended. The insula and everything in the Sylvian fissure were normal. There was no tumor in the cerebellum.

Both lobes of the cerebrum fluctuated. The lateral ventricles were six inches long antero-posteriorly and were filled with cerebro-spinal fluid amounting to about twelve or fourteen ounces. The foramen of Monro was dilated, and through it a grayish translucent tumor was at once seen in the third ventricle. When this was exposed the tumor was found to extend from the anterior commissure to the posterior. It was fused with the anterior commissure, and pressed upon the posterior commissure and corpora quadrigemina, but was not fused with them. The

aqueduct of Sylvius posteriorly and the pillars of the fornix anteriorly were widely separated by the tumor. Posteriorly the peduncles of the pineal gland were also widely spread out on the two sides of the tumor. Laterally the tumor fused with the optic thalami.

The tumor had pushed down the floor of the third ventricle and had also elevated its roof, the fornix. On the surface of the tumor anteriorly was a small brownish-green, almost black, cyst, which on being opened discharged twenty minims of yellow fluid, resembling bile. Next to it, but deeper, was another cyst filled with almost perfectly black fluid. The interior of the tumor showed several cysts, giving it a sponge-like appearance on section. The tumor was somewhat denser than the brain substance.

The following report as to the microscopical appearance was made by Professor William Osler:

"A small portion from the superficial part of the tumor when teased showed innumerable fibres, the majority of which represent the tail-like extensions of spindle cells; some of these are of extraordinary length. Certain of these fibre cells have a curious translucency. Among these, in considerable numbers, are irregularly-shaped cells, somewhat larger than ordinary leucocytes.

"The deeper portion of the growth is denser, the fibres being more closely set, and among them are many large cells with and without processes, which resemble in a remarkable degree ordinary ganglion cells. The tumor corresponded to the neuro-glioma of Klebs, a not uncommon growth in this situation."

This case is only another added to the many of a wrong diagnosis of the location of a cerebral tumor. Certainly, to me, at least, and to the majority of the consultants, it seemed most likely to be in the cerebellum, though some doubted it very much. Of course, if a correct diagnosis of its location had been made, no operative interference would have been undertaken. I have placed it upon record, both as an error of diagnosis and as a means of correcting such errors, possibly, in the future. From a surgical point of view, although the operation was a mistake, yet it was at the same time a merciful one, for the poor boy was suffering to such a degree that death was a blessing.

CASE IV.—*Tubercular tumor in the motor area; operation; operative recovery; death; autopsy.* W. M., aged fifty-two years, Scotchman, was admitted to the Infirmary for Nervous Diseases, under the care of Dr. Morris J. Lewis, August 6, 1890, who furnishes the following history: "He is a button-maker, and calls himself a 'moderate drinker,' taking about three glasses of beer daily, and getting drunk every Saturday. He smokes excessively; denies syphilis; admits gonorrhœa. His family history is unimportant, except that his mother had some nervous trouble, which compelled her to stop when she had walked about 100 yards, before being able to proceed further. At five years of age he received a blow above the right eye, but no ill effects have followed. A scar marks the site of the injury. Has never had rheumatism except once, after exposure to wet.

"His present trouble began seven or eight weeks ago, with tingling on the inner side of the index finger of the left hand, extending to the whole hand and lasting five minutes. Immediately after this there was twitching of the left side of the mouth, lasting for a minute. Speech was lost for a few seconds, and then was 'thick.' Four weeks later he had clonic spasm of the head, which turned to the left. The attack lasted for five minutes, and speech was lost for a few moments. He knew what he wanted to say but was not able to move his tongue. Two weeks later the same sensation recurred in his hand and lip, attended with gradually increasing weakness on left side, beginning in the arm."

Status præsens. He has had but very little headache, but to-day it is very bad in the frontal region. He sleeps badly; appetite poor; bowels constipated. Passes the average amount of urine, with a specific gravity of 1020; no albumin, no sugar. When in repose his mouth is straight, the left naso-labial fold being less marked than the right. Eyes shut well; can whistle well. On making grimaces there is some drawing of the mouth to right. Pupils equal, and react well. Tongue protruded straight. Dynamometer: R., 135; L., 120. Knee-jerk, elbow-jerk, and muscle-jerk exaggerated on both sides. Scrapes his left foot slightly in walking. Sensation good, heart normal. There is no tenderness or œdema of scalp; no vomiting; does not now miscall words.

August 27. Dynamometer: R., 130; L., 90. Sometimes in swallowing, liquids "go the wrong way." He is suffering much from headache. Knee-jerk is most marked on the right side.

September 24. He has had violent headache for two weeks, although the iodide of potassium, which he had been taking in increasing doses, had been stopped for a week. Dynamometer: R., 135; L., 100. No tenderness.

October 1. His headache has improved under bromide of potassium. There are indistinct choreic movements of the hands. Dynamometer: R., 110; L., 85.

November 26. Six days ago he had a convulsion, beginning in the index and little fingers of the left hand, with clonic spasm in flexion and extension, then clonic spasm of all the fingers of the hand on this side, followed by severe headache, so that he had to go to bed. On the next day after the above attack he had two similar attacks, beginning in the left hand, and he became very rigid, with great pain in the loins. Dr. de Schweinitz reported on his eyes as follows: "O. D., round, slightly œdematous disk, full central lymph-sheath, slight epithelial chorioiditis. H = 3 D. O. S., oval disk, margins veiled, full lymph-sheath, marked absorption of the pigment epithelium; pupil actions normal, form field uncontracted; central vision normal, and external ocular muscles unaffected.

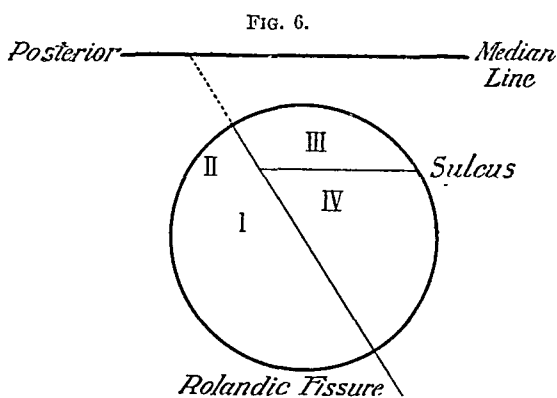
December 3. He has clonic movements of the arm in certain positions. This appears to be in the muscles of the shoulder only, and the vibrations are slow. There is noticed a tendency to reduplication of the first sound of the heart. The valves of the superficial veins of the head and neck are markedly prominent. The epigastric and abdominal reflexes are less marked on the left side than the right, but both are exaggerated. Left testicle reflex diminished; none on right side.

17th. Dynamometer: R., 125; L., 35. Speech thicker. He is getting listless and losing interest. His left hand is cold and blue. The eyes show somewhat more of a retinal haze.

February 22, 1891. He has never noticed any asymmetrical sweating nor flushing, nor any unilateral subjective sensations. Temperature sense equal and well preserved in face and hands. Sensation to pain good and equal on both sides in face and hands. Localizing power good on both sides of face. *Æsthesiometer*—two points differentiated: R., $1\frac{1}{8}$ inches; L., $1\frac{1}{4}$ inches, on dorsum of hands; on both cheeks, $1\frac{1}{2}$ inches. No chin-jerk. Tendon-jerks and muscular irritability greater on the left than the right side. Temperature sense on dorsum of both feet good. *Æsthesiometer*—two points recognized: R., $1\frac{1}{8}$; L., $1\frac{1}{2}$ inches. Sensation to pain good and equal in both feet. Localization good in both feet and legs. Pressure-sense equal and normal on the two sides in hands, arms, feet and face.

Operation, February 24, 1891, by W. W. Keen. Before the operation, extract of ergot $\frac{5}{32}$ gr and $\frac{1}{4}$ gr. of morphine were administered. Just as he was about to be etherized a convulsion occurred, the first one that Dr. Lewis or I had seen. There was absolutely no effect upon consciousness, and the convulsion was limited to the left arm, with clonic extension of the left forefinger, slight clonic extension of the forearm (it lay on the arm of the chair in which he sat). This flexion of the forearm was not due to the action of the biceps, but may have been due either to the flexion of the brachialis anticus or the flexion of the hand at the wrist, which lifted the forearm. The convulsion only lasted a half-minute. The patient was placed semi-recumbent on a lounge and kept from slipping down by a sheet passed between the thighs, the two ends being fastened to the head of the lounge.

His cranial index was 71, and therefore the angle of the fissure of Rolando was 67° . From the glabella to the inion was 14 inches. It



Showing the points at which the brain was stimulated.

was decided to trephine over the right elbow center, and the fissure of Rolando having been marked out, a point 2 inches along this line and $1\frac{3}{8}$ inches to the right of the middle line was fixed upon as the probable point. A button an inch and a half in diameter was then removed, the line of the fissure of Rolando having first been fixed at the two extremities of the fissure by nicks in the bone. The button removed was normal externally and internally, excepting as to its thickness. At the thickest point it measured three-eighths of an inch, and at its thinnest a little over a quarter of an inch. On opening the dura the brain pulsated. Its color seemed to us slightly yellower than the normal. The

fissure of Rolando ran precisely in the centre of the opening. The pre-Rolandic convolution was divided by a sulcus running from behind forward and a little upward. A large vein lay in the fissure of Rolando, and in this fissure and in the little sulcus just mentioned, the membrane was slightly cedematous and yellowish. The Faradaic battery was then used to locate the centres (secondary current coil $1\frac{1}{2}$ exposed). The cortex was touched at four points, I., II., III., IV., in order named. The patient was not fully under ether during this test. (Fig. 6.)

I. Post-Rolandic convolution, $1\frac{3}{4}$ inches from the middle line. Right forefinger and right leg lifted (thought to be due to the imperfect anæsthesia at the moment). Extension of left forearm followed by clonic flexor spasm, with extension and flexion of the left wrist, slight motion of lower lip to the left, and protrusion of tongue between the teeth to the left (possibly due to imperfect etherization).

II. Post-Rolandic convolution, $1\frac{1}{4}$ inches from the middle line. Left shoulder lifted, left arm carried over the chest, elbow at a right angle. Clonic convulsive movement of abductors of left shoulder, decided movement of the lower jaw and lip.

III. Pre-Rolandic convolution, $1\frac{1}{4}$ inches from the middle line. Clonic convulsive movements of the left arm across the chest, with forearm flexed, ending, as before, in tonic extension of the wrist. Two slight twitchings of lip (the side was not noted).

IV. Pre-Rolandic convolutions, $1\frac{5}{8}$ inches from the middle line. (All these measurements are taken in straight lines at a right angle with the middle line, with the exception of the location of the centre, which is two inches along the line of the fissure of Rolando.) Extension of left fore-, middle- and ring-fingers, followed by clonic movements of extension of the wrist. No response of the face. By touch there is no difference in resistance in the pre- and post-Rolandic convolutions. Both of them give an impression to the finger similar to a floated patella in effusion into the knee-joint; that is, the pressure of the finger seems to depress a layer of less density, and further pressure is arrested by greater resistance.

At point I. in the post-Rolandic convolution an incision about 1 cm. long and 1 cm. in depth was made, but nothing issued but a little blood. The blunt point of Allis's dissector was then pushed in 2 cm. in depth, but nothing was revealed by it. The escaping blood diminished slightly the bulging of the brain, which, from the moment of opening the dura, had been progressively increasing, and now had reached slightly above the external surface of the skull. No further interference was deemed wise.

The dura was then sutured with catgut. One small vessel in the cerebral substance and two in the dura were tied with catgut by a ligature passed under them with a curved needle. The scalp was sutured with silk, and no drainage was used. A sterilized dressing was then applied. The bone button was not replaced.

March 5, 1891 (tenth day). Surgically speaking, he did remarkably well after the operation. The sutures were removed on the fifth day. His highest temperature was once 99.6° , most of the time being 99° . Yesterday, however, his temperature rose to 101.6° . It was found that the flap was somewhat swollen, and on making a slight opening at one point, about two drachms of thick, black blood were pressed out from the lower anterior end of the incision. His temperature fell at once, to

98.6° by this morning. Two days after the operation he was unable to move his fingers or wrist, but could slightly flex and extend the elbow. Sensation seemed to be unaltered, but his mental condition made the determination of this unsatisfactory. On the fourth day after the operation his elbow movement was lost, and the only movement of the arm was in the flexion of the fingers. Two days later the left knee seemed to be a little stiff and adduction of the left leg a little sluggish. The elbow movements began to return on March 3d, eight days after the operation.

10th (fifteenth day). The power of movement in the left arm has gradually improved. His forefinger, however, cannot be flexed or extended, nor is there any adduction or abduction of the thumb. He is out of bed and walking about the ward. To-day slight left facial palsy was noticed as before the operation. His mental condition bad; he is very despondent and his sleep is poor. The discharge of thick, black blood has continued in a gradually lessening amount until the present time, but has now ceased.

22d (one month after the operation). All power of movement in the left arm is now lost saving slight flexion of the fingers. His mind is markedly dull. The left leg is slightly paretic, and there is complete paralysis of the left face.

26th. The catheter has had to be used at intervals ever since the operation. To-day he has had involuntary evacuation of urine. He is very weak, and his voice has fallen almost to a whisper. He is quite stupid mentally, and has to be fed like a child. Paralysis of left arm and left face complete, but he can still move his left leg.

31st. Much brighter; retains and passes his urine.

July 1st. Dr. de Schweinitz examined his eyes and reported as follows: "O. D., marked papillitis, apex of swelling + 7 D. O. S., similar condition; general fundus + 3 D. No hemorrhage in either eye; the pupils and form fields normal."

September 5th. Since the last date he has gradually lost strength, and finally took again to his bed. By August 6th his temperature ran up, until September 3d it attained 102.8°, falling on the 5th to 101.4°, shortly before his death that evening.

Post-mortem notes, by Dr. Charles W. Burr, September 6, 1891, nineteen hours after death:

Body much emaciated. Abdomen very green. Slight rigor mortis.

There was marked sinking-in of the scalp at the trephine opening. The scalp itself was normal throughout, the flap having healed so as to leave a very insignificant scar. There was a slight adhesion between the scalp and the membrane, filling the trephine opening.

The skull was normal throughout. The trephine opening was filled by a thin, translucent, fibrous membrane closely adherent to the dura. A line drawn from ear to ear over the skull passed almost through the centre of the trephine opening, the highest point of which was on this line at a distance of $5\frac{1}{4}$ inches from the upper junction of right ear and scalp and $\frac{3}{4}$ inch from the sagittal suture. Diameter of opening, $1\frac{1}{2}$ inches.

On removing the skull-cap, the dura was found adherent for a short distance around the trephine opening, and to the membrane filling the opening. The dura was also thickened here, and adherent to the brain, so that the latter was torn. The remainder of the dura was normal.

Under the trephine opening, and involving the ascending parietal and ascending frontal convolutions, the brain-matter was softened, mush-like, reddish in color, and, indeed, completely disorganized. There was no apparent œdema of the brain. The convolutions were of average appearance.

The optic nerves were swollen and reddish. The papillæ were swollen and semi-translucent. The central arteries of the retinæ were not visible at their entrances from the disks, but on the retinæ, at a little distance from the disks, several swollen and tortuous bloodvessels were seen.

Spinal cord. On opening the dura, quite a large quantity of clear fluid escaped. The membranes and cord appeared normal.

Thoracic cavity. The left pleural cavity contained a quart of clear, straw-colored fluid, in which were flakes of lymph. Pleura thickened, and strong bands of fibrous tissue passed between the lung and parietal pleura. Within the left lung, at the posterior part and below the apex, was a cavity about the size of an orange, with thickened walls and arteries crossing it. In the right pleural cavity there was a little clear fluid, slight adhesions existed at the apex on several old scars, and the lung tissue was crepitant throughout and but slightly congested.

Heart. Size normal. A little blood in either ventricle. Valves normal.

Kidneys. Left slightly enlarged, lobulated. On the surface were two small cysts, one filled with a dark, thick fluid, like broken-down blood; the other with a clear watery fluid. Capsule stripped off with some difficulty. Cortex and medulla well differentiated, the former being slightly thicker than normal. The right kidney, except that no cysts were present, was like the left.

Stomach dilated with gas.

Liver, spleen, and intestines showed nothing pathological.

October 25, 1893. *Examination of the hardened brain*, by Dr. Lewis: The entire brain had been hardened in Müller's fluid and alcohol. The dura was found to be adherent upon the right side over the upper portion of the fissure of Rolando. An area of destruction existed upon the right side of the brain, with its centre over the middle of the fissure of Rolando, extending upward to within three-quarters of an inch of the middle line, and downward to within an inch of the fissure of Sylvius. Laterally this invaded the whole of the ascending parietal and the ascending frontal convolutions to the points previously mentioned, thus leaving the upper and lower portions of these two convolutions intact. The destruction of tissue was deepest in the centre of this area, extending well into the white substance, and becoming shallow toward the periphery, where the gray substance only appeared invaded.

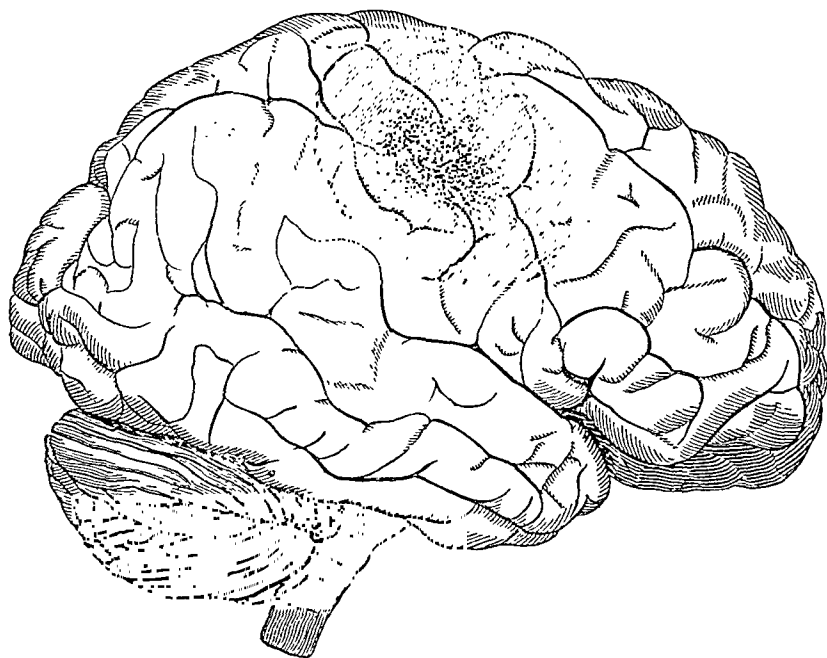
The convolutions immediately above this area, that is, between it and the middle line, appeared sunk a little below the surface of the brain, as if the destroyed portion had allowed them to sink down.

Perpendicular sections made at half-inch intervals from the front of the brain backward showed that this area was the only portion diseased (at least macroscopically). The basal ganglia appeared to be perfectly normal upon section.

The portion of the brain described as "mush-like" in Dr. Burr's notes of the autopsy (the area of destruction mentioned above) (Fig 7) had undergone considerable shrinkage in the process of hardening, and no structure could be detected by the naked eye to indicate its nature, as it

had the appearance of being disorganized brain tissue. A portion removed for microscopical examination, which was made by Dr. Burr, proved it to be a tubercular tumor undergoing secondary softening and caseation.

FIG. 7.



Tubercular tumor involving the cortex. The darker area is that of softening.

REMARKS BY DR. LEWIS.

During the patient's life no more accurate diagnosis seemed justified than that a focus of irritation, in all probability a growth, existed, either cortical or subcortical, in the immediate vicinity of the arm centres upon the right side, the following *résumé* of the symptoms appearing to justify this view, viz.:

Sensory disturbances in left hand, followed by local convulsive movements in left hand and arm, and also in slight degree in the lower left face, followed by gradually increasing paresis of the arm, face, and leg, these parts being affected, as to degree, in the order named, the most marked paresis being in the arm. No choked disk existing seemed to indicate that most likely there was not a great degree of intra-cranial pressure present, at least not sufficient to cause marked intra-ventricular effusion.

As medical treatment had failed to ameliorate the symptoms, and as the patient was slowly growing worse, it was decided to operate. The convulsion occurring just as the patient was being etherized, which was confined strictly to the left hand and arm, seemed to justify the conclusion arrived at in regard to the seat of the irritative process.

The tumor was not recognized at the operation, nor any condition to justify the diagnosis made, the only abnormal condition recognized being the yellowish color and the oedematous appearance of the brain tissue, and the increased tension of the skull contents.

The case is very interesting and instructive from several standpoints. The tubercular tumor in the brain was in all probability secondary to the condition found in the lung. The latter trouble had evidently advanced much farther than was supposed to be the case. Subsequent to the operation the interest in the case centred in the "nervous" symptoms, which seemed difficult of explanation; the condition of the lung, although previously recognized, received but little attention, yet there must have been rapid progress made in the disease in this locality during this period. Under the new light thrown by the autopsy, it is evident that this point should have been more fully considered; the points which then seemed so difficult of explanation now appear clear.

The tumor was not detected at the operation, as previously mentioned, and this naturally raised doubts as to the accuracy of the diagnosis.

The appearance of pronounced papillitis which had not existed prior to the operation, and the subsequent increase of the paralysis after this had lessened two weeks after this period, are now readily accounted for by the probable increase in size of the tumor, the further involvement of the affected motor area, and the subsequent degeneration of the part affected.

No benefit, naturally, followed the operation, although the removal of the button of bone must have given relief to the intra-cranial pressure. The examination of the area exposed by the trephine, which the autopsy proves was correctly placed, was as thorough as was deemed wise, and in the retrospective view of the case it does not appear how the non-recognition of the tumor could have been avoided. The true condition of affairs was not even recognized at the autopsy, nor was it patent at the naked-eye examination of the hardened brain. Prior to the final microscopic examination, the doubt existed whether the disorganization might not be dependent upon secondary troubles following the operation and in consequence of it, a doubt which the discharge of black blood lasting until the fifteenth day seemed to strengthen.

Finally, it may be said that the localizing symptoms were properly interpreted and the trephine correctly placed to uncover the diseased area, the recognition of the mass being prevented by its character, which at the time of operation was in all probability one of infiltration of the tissues, giving to the naked eye the appearance previously described; the incision made at the time dispels the idea that the tumor was then subcortical only. Had this especial tumor been

detected it is not likely that any benefit would have accrued to the patient, as, considering its nature and the general condition of ill health of the patient, it is doubtful if his life would have been prolonged had the mass been removed.

REMARKS BY DR. KEEN.

There is little to add to what Dr. Lewis has said. The indications for an exploratory operation seemed to be amply sufficient, and the progressive bulging of the brain as soon as the dura was opened confirmed the diagnosis of tumor. Unfortunately, though we fell upon the exact spot where it lay, the macroscopic appearances misled us, and the punctures did not reveal its presence. Had a small portion of the brain been removed for microscopic examination at the time, great light would probably have been thrown upon the case, and the later symptoms more correctly interpreted. In this case it is doubtful whether, even if the tumor had been recognized, I could have removed it, as it had no recognizable borders, and was not hard enough to give any resistance to touch, and thus guide me as to the area which should have been removed.

ON ASCITES CONNECTED WITH NUTMEG LIVER.

BY JOHN SYER BRISTOWE, M.D., LL.D., F.R.S.,

CONSULTING PHYSICIAN TO ST. THOMAS'S HOSPITAL, LONDON, TO THE VICTORIA HOSPITAL FOR CHILDREN, CHELSEA, AND TO THE WEST END HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM; PRESIDENT OF THE MEDICAL SOCIETY.

It often happens that cases of special interest and mutually illustrative come under observation in groups, so that the lessons which they individually teach become accentuated, and thus the more deeply impressed on the memory. Thus, recently I have had in my wards, at the same time, three cases of ascites immediately due to nutmeg liver, consequent on chronic mitral-valve disease. It may be said there is nothing very remarkable in this coincidence, for nutmeg liver and general dropsy are the natural and ordinary consequences of mitral obstruction or incompetence, and a certain amount of ascites is an item of general dropsy. But in my cases, as it seems to me, the ascites could not be thus explained; for in one there was no general dropsy and in the other two the quantity of fluid in the abdomen was excessive in relation to the amount of anasarca present. There was clearly some local cause determining the local accumulation. Again it may be said, there is nothing very remarkable even in this; for the nutmeg, like the cirrhotic liver, tends, though in a lesser degree, to interpose an obstacle to the

free escape of venous blood from the abdomen, and thus to the production of ascites. This I admit; at the same time, my own experience leads me to believe that ascites as a consequence of nutmeg liver is comparatively uncommon, and hence to regard the occurrence of three such cases among my hospital patients at the same time as noteworthy and instructive. My cases are the more interesting and impressive, because, while in one (which is still in progress) ascites and œdema of the lower extremities were alone present, in the other two there was an alcoholic history which justified the belief (while the patients were living) that they were the subjects of cirrhosis—a belief which was disproved by post-mortem examination.

There are a few other points which my cases illustrate, to which in due course I shall call attention.

CASE I.—Agnes P., a married woman, aged forty-six years, has been under my care on two occasions, first, from June 25 to July 15, 1891, and second, from September 10 to October 17, of the same year. It appeared that she had had a severe attack of acute rheumatism when sixteen years of age, but had subsequently enjoyed uninterrupted good health down to the commencement of her present illness, three months before her first admission. At this time she began to suffer from shortness of breath. This was followed before long by swelling of the abdomen and œdema of the legs, which gradually increased in severity, and a little later by cough and the expectoration of mucus tinged and streaked with blood, and of small clots. Six weeks before becoming my patient she was admitted into University College Hospital, where under treatment she improved, and all signs of dropsy subsided, so that at the end of three weeks she was discharged. Soon, however, her symptoms recurred.

On admission, she was a spare woman with a congested and somewhat dusky face, complaining mainly of dyspnoea, which prevented her from lying down, cough, and enlargement of the abdomen. There was no anasarca. The præcordial dulness was somewhat enlarged, and the apex of the heart-beat in the sixth interspace a little outside the nipple line. The impulses were diffused and feeble and attended with a very slight thrill. The beats were very irregular and about 98 in the minute. Auscultation revealed the presence of mitral and apparently also of aortic valve disease. The sounds varied somewhat from time to time, but the outcome of repeated examinations was as follows: There was a soft but well-marked apex systolic murmur which did not vary with respiration, but was not always audible; there was a presystolic murmur in the usual situation, which also varied—sometimes it was absent, sometimes short, sometimes prolonged and drawling; the second sound was reduplicated, the reduplication being best marked about the level of the nipple, but also well heard at the apex; the second element (which was doubtless due to the aortic valve) was followed by a feeble but roughish murmur, which was loudest and most prolonged at the apex, but was distinctly audible at the level of the nipple, when the true presystolic sound could not be heard. Occasionally, at the apex this sound blended with the presystolic murmur, and thus the two formed a continuous rumble, extending from the aortic second sound to the first sound. Generally the lungs appeared

to be healthy, but there was some dulness at the right base and a little subcrepitation. She had a slight cough with scanty expectoration; and, although her respiration was only twenty-four in the minute, she complained of dyspnœa and had to sit up in bed.

The abdomen was large, thirty-three inches in girth, rounded, and tense and dull in the flanks, and obviously contained fluid. The liver extended for about two inches below the costal margin, and was smooth and tender. The urine was acid, had a specific gravity of 1022, and contained one-eighth albumin.

During her stay in the hospital she suffered occasionally from severe headache, and for some days from rheumatic pains in the joints of the arms and in the feet, with swelling and tenderness of the right great toe. But she gradually improved; and when she left the hospital she had lost all traces of her ascites and of her pulmonary affection; she could lie down with comfort and did not complain of short breath; the action of her heart had become almost regular, and the albumin had disappeared from the urine.

After leaving the hospital she remained for two or three weeks fairly well. Then all her old symptoms gradually re-developed, and when readmitted on the 10th September she was more seriously ill than I had yet seen her. She was livid in the face and extremities, was suffering from diarrhœa, sickness, and great dyspnœa, and had considerable anasarca of the lower extremities. The condition of her heart as to dimensions and murmurs was unaltered; but its beats varied between 140 and 180 in the minute, and were very irregular. There was crepitation at the base of the lungs, and apparently a little fluid at the right base. The abdomen was more distended than formerly, having a girth of thirty-six inches, was dull in the flanks, and presented a marked fluid thrill. The liver extended almost to the umbilicus. The urine had a specific gravity of 1028 and contained one-twelfth albumin and much urates. Again under treatment the patient improved. The dyspnœa disappeared, at any rate, as she lay in bed; the heart's action improved; the abdomen shrunk in girth from thirty-six inches to thirty-one and one-quarter, and the fluid disappeared from it and from the lower extremities; the liver became smaller, though still remaining enlarged; and the urine lost all trace of albumin.

On both occasions she was treated mainly with digitalis and iron and kept at rest in bed.

CASE II.—G. B., a waiter, aged thirty-four years, came under my care on August 21st. He had had three attacks of rheumatic fever, the last being four years previously; otherwise he had had good health until the commencement of his present illness, twelve months ago. He then began to suffer from shortness of breath and palpitation, which continued. Six months later his abdomen began to enlarge, and two months ago œdema of the lower extremities came on.

He was a fairly well nourished man, with a livid face, general anasarca, the dropsy being most abundant about the buttocks and in the lower extremities, and a large tense abdomen. The heart's apex beat a little outside the nipple line, but on the normal level; its action was quick and irregular and was attended by a systolic murmur at the apex, extending into the axilla, and accentuation of the second sound at the left base. The apex beat was diffused and weak, and there was pronounced epigastric pulsation. It was stated that he had presented a

presystolic murmur, but this I never heard. The lungs appeared to be healthy with the exception that there were some coarse crepitations at both bases. The abdomen was large and tense, forty-three inches in girth, and contained much fluid. There were no enlarged veins in its walls.

During his residence in the hospital the sounds of the heart remained unchanged; its beats varied roughly from 100 to 180 in the minute and were very irregular in force and rhythm, and not infrequently presented a well-marked bigeminal character, and the abdomen was tapped on four occasions, viz., September 2d to fifteen pints; September 17th to sixteen pints; September 29th to fourteen pints; October 16th to ten pints fourteen ounces, and October 30th to seven pints eight ounces. On each occasion after the operation the liver was found to extend to the level of the umbilicus, to be smooth and free from tenderness; the urine was frequently examined, and was found occasionally to present a trace of albumin, but usually none. He suffered a good deal from nausea and sickness, occasionally from diarrhoea; and at times had bleeding from the nose. He complained of shortness of breath, cough, and scanty expectoration occasionally tinged or streaked with blood.

The patient grew progressively weaker, latterly very drowsy and quiet, and he died on the 6th November. He was treated mainly with digitalis and iron.

The *autopsy* revealed the following facts. There were old adhesions in both pleuræ, and both lungs were congested and friable in their lower parts. Some old pericardial adhesions also were present. The heart was large and dilated, especially on the right side, weighing seventeen and one-quarter ounces. The aortic valve was thickened and contracted at the edges and incompetent. The mitral orifices were narrowed; and the valves and the chordæ tendinæ were thickened. The abdomen contained five pints of fluid, and presented extensive old adhesions, the capsules of the liver and spleen being much thickened. The liver was large, weighing four pounds, and was in a well-marked "nutmeg" condition; spleen large and firm, weighing seven and three-quarters ounces; kidneys also large and congested. There was œdema of the lower extremities.

CASE III.—H. M., a coachman, aged forty six years, was admitted under my care on October 23, 1891. He had been a heavy drinker for years, and eight years ago had suffered from rheumatism, but otherwise seems to have had good health. His present illness had begun five weeks ago with pain after food, and sickness, which symptoms were followed in a short time by a shortness of breath, palpitation, and some cough. He had also been passing more water than usual. During the last week or ten days he had observed swelling of the legs and slight jaundice.

He was a short, florid man, presenting general anasarca, most marked in the legs: enlargement of the abdomen, and distinct icteric tinge. His chest was duly resonant; but over the greater part of both lungs there were rhonchi to be heard, and at the bases slight crepitations. The inspirations were twenty-five in the minute, and he had some cough unattended with expectoration. The cardiac dulness was not appreciably enlarged, but the impulses were heaving and diffused. The action was irregular, and 180 in the minute. A systolic murmur was audible at the apex, and conducted into the axilla; the pulse was small and

feeble, and there was no visible pulsation of arteries; the abdomen was large, and obviously contained fluid, and the liver extended about a couple of inches below the ribs; the urine contained a trace of albumin and a little bile.

During his stay at the hospital he suffered continuously from general anasarca, especially marked in his lower extremities, and his jaundice deepened somewhat; no change took place in the condition of his lungs, but his respirations were usually from thirty to forty in the minute. The cardiac sounds indicated no change, and his pulse, which continued very irregular and feeble, varied from about 140 to 160 in the minute: His abdomen was for a time enlarged owing to increase of fluid in it, and on December 3d measured thirty-nine and one-quarter inches in girth, but subsequently diminished to thirty-seven. There was generally some degree of tenderness in the liver, but no pain; his sickness ceased, but, for some days without any obvious cause he suffered from profuse diarrhœa, and during this time and afterward the urine, which had been abundant, became scanty; the fluid always contained bile, and usually a little albumin, and its specific gravity was for the most part above 1020. Also soon after admission he became delirious, and continued so, seeing animals about him; he was very noisy at times, and occasionally unmanageable. He gradually got weaker, and died on the morning of December 11th.

In addition to medical treatment which varied from time to time, his legs were tapped by means of Southey's tubes, but without any material benefit.

Autopsy. General slight jaundice; much œdema of feet and legs; a little fluid in both pleuræ; lungs large, congested, œdematous; a large recent hæmorrhagic infarct in the right. Heart flabby, large and much dilated, weighing eighteen ounces; aortic valves uniformly thickened, and slightly incompetent; mitral valves freely incompetent, owing to great thickening and contraction of flaps and chordæ tendinæ; free regurgitation at tricuspid valve. The abdomen contained about a pint of fluid; liver large, weighing four pounds one ounce, rather deeply jaundiced, and in a fairly advanced nutmeg condition; no appearance of cirrhosis or of dilatation of ducts; spleen very firm and small, weighing only two and one-half ounces; kidneys of natural size and of dark-red color; an old cicatricial infarct in the left.

The few remarks I have to make on the cases I have just narrated will have reference—1, to the ascites; 2, to the cardiac phenomena; and 3, to treatment.

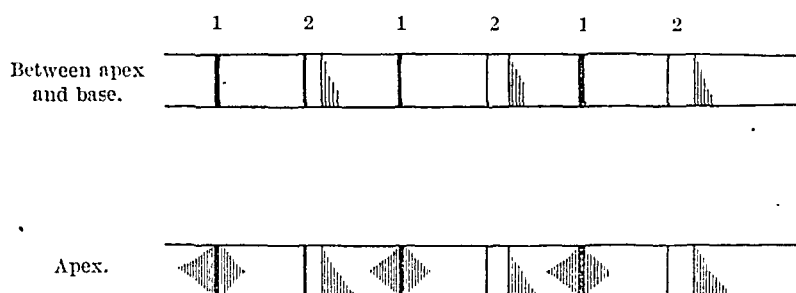
1. It is obvious, as I before observed, that in each of my cases the ascites was excessive in relation to the amount of general anasarca, and that its excess must have been due to the operation of some local cause. It is admitted that the nutmeg liver, after a time, becomes the seat of chronic inflammatory changes which impede the transmission of blood through the organ, and thus tend to cause passive congestion of the tributaries of the portal vein and consequent abdominal dropsy. This is not improbably the explanation of the ascites in my cases. But it seems to me that, even if no such structural impediment were present, there would still be a tendency (in cases of obstructive cardiac or pul-

monary disease, attended with general systemic venous congestion) to a relatively greater degree of sluggishness of blood-flow and of congestion in the portal circulation than elsewhere—owing to the fact that, whilst the blood in this region would be subjected to no greater degree of *vis a tergo* than the blood of other regions, it would, from having to pass through a system of capillary vessels before reaching the cava, suffer in a greater degree from the effect of resistance *a fronte*. It might be replied that the argument tends to show that abdominal dropsy should be present as a physiological condition in all healthy persons, and consequently proves too much. But I do not myself think that this objection holds; for if several streams be flowing with different degrees of velocity and force into a common channel, which is sufficient under ordinary circumstances to allow of the due transmission of their contributions and to duly drain their several watersheds, no flood would be likely to arise. But if this common channel should become partially obstructed, it is clear that the more rapid and forcible streams would discharge themselves in greater degree than the more sluggish and feeble streams, and that the districts which the latter drain would become earlier and more seriously flooded than the others.

My second case during its progress presented in connection with the presence of ascites two or three interesting, though not unusual, clinical phenomena, to which, however, I did not refer in my brief narrative. The first is, that when the abdomen was dropsical, a layer of fluid (which as the patient lay on his back became increasingly thick as one passed from the median line to the right flank) intervened between the liver and the parietes, and could be readily recognized by prodding with the finger perpendicularly inward, and thus first displacing the fluid and then impinging on the hard surface of the liver. The second is, that we could both see and feel a fluid wave, due to each contraction of the right side of the heart, which, commencing in the scorbiculus, spread then in a widening arc, but with diminishing force, over the whole abdominal surface. The third was, that in connection with some not very severe peritonitic symptoms which followed the first and second tapping, we could hear, just below the ensiform cartilage, very distinct coarse crepitation sounds attending the respiratory movements, but best evoked by pressure with the stethoscope.

2. It is an interesting fact that in all three cases there was, in addition to mitral disease (to which no doubt the patient's special symptoms were due), aortic regurgitation, which was either not recognized during life or was recognized with difficulty. The regurgitation must have been very slight, for without exception it was unattended with the characteristic arterial pulsation, with capillary pulsation, or with obvious impairment of the second sound at the right base. The hearts were examined over and over again, both by myself and other competent persons. And

certainly no regurgitant aortic murmur was ever discovered in either of the two fatal cases by any one of us. In the first case the cardiac sounds formed an interesting study: a variable presystolic and asystolic murmur furnished abundant evidence of the presence of both mitral obstruction and mitral regurgitant disease. But the sound indicative of aortic regurgitation might easily have been overlooked or misinterpreted; for it was inaudible at the base, comparatively loud at the apex within the small area to which the true presystolic murmur is limited, and not infrequently blended with this latter into a murmur occupying the whole of the left ventricular diastolic period. But there was reduplication of the second sound of the heart, the second element being due to the closure of the aortic valves. It was this sound which was immediately followed by the diastolic murmur, which murmur (though at the apex apt to be lost in the true presystolic murmur) was audible midway between the apex and base, a point to which the true presystolic murmur did not reach. The following diagram will illustrate my description.



3. It appears to me that in such cases as I have cited the abdominal dropsy does not, as a general rule, call for special treatment. The treatment which is appropriate in obstructive cardiac disease is the treatment appropriate for this particular complication. Rest in bed and the employment of drugs calculated to strengthen the action of the heart tend to cure the ascites, as they do to remove or relieve the patient's other troubles. These measures proved efficacious on two occasions in my first case; and even in my last (which ended fatally) were attended with the almost complete removal of the abdominal accumulation. In some cases, as in my second, tapping will be needed. And there is no more reason why it should be delayed or avoided here than in cases of ascites due to other causes.

VASOMOTOR ATAXIA: A CONTRIBUTION TO THE SUBJECT OF IDIOSYNCRASIES.¹

BY SOLOMON SOLIS-COHEN, M.D.,

PROFESSOR OF CLINICAL MEDICINE AND APPLIED THERAPEUTICS IN THE PHILADELPHIA
POLYCLINIC; ONE OF THE PHYSICIANS TO THE PHILADELPHIA
HOSPITAL, ETC.

THE present paper is intended merely as a record of personal observations, and presentation of conclusions based thereon; it will not, therefore, refer to facts and theories in literature, though many observations parallel with, and confirmatory of, the views expressed have been found. The exigencies of time necessitate citation of a few only of the cases studied, which, excluding the more numerous instances of slight departure from the norm, altogether number sixty odd, accumulated in hospital and private practice during the course of some eight years; and such reports as are made must be brief. I would request, therefore, that it be assumed, in discussion, that despite brevity of account these cases have been investigated from all standpoints with as much thoroughness as I am capable of, or as the opportunities permitted.

The varying susceptibilities of different individuals, and of the same individual at different times, to the same influences has long been a matter of every-day observation. Of a number of persons exposed to cold and wet at the same time and place, one may have articular rheumatism, another pneumonia; one may contract tonsillitis, another nephritis; others may escape apparently unharmed. Evidently there is something at work in addition to inclement weather and specific microbes; and this something, which is the determining and therefore the principal etiological factor, is special to the individual—is a physical personal equation. We call it, whether exhibited in relation to the exciting causes of disease or to the action of drugs, individual liability, predisposition, idiosyncrasy; and though our terms are singular in type, we recognize that the singularity is relative and may be exhibited by several persons.

For every idiosyncrasy there must be a physiological basis. By comparing the phenomena, special and general, exhibited by a group of persons presenting similar or identical idiosyncrasies, we take a step toward the recognition of the basic physiological conditions.

I would invite attention to an idiosyncrasy of the circulatory mechanism, which, in its extreme degrees, manifests itself in the form of well-recognized symptom-complexes; in its minor degrees gives rise to puzzling manifestations of great variety of detail; and in its least-

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developed forms often passes unnoticed. For this condition—which seems to depend upon a feebleness in the co-ordinating mechanisms in consequence of which the balance of the cardio vascular action becomes disturbed by influences that in the great majority of persons have no such effect, and greatly disturbed by influences that normally have slight effect, while the restoration of equilibrium is slow and imperfect—I would propose the self-explanatory name of *vasomotor ataxia*: ataxia rather than hyperkinesis, or hypokinesis, because excessive vascular dilatation and excessive vascular constriction may be either spasmodic or paretic, or both spasmodic and paretic, as dilator or constrictor nerves, or both, are affected; and even in the extreme and opposite types of vasomotor ataxia, the phenomena, while always more or less paroxysmal, are neither exclusively those of dilatation nor exclusively those of constriction, but both abnormal dilatation and abnormal constriction are usually present in varying degree in the same patient. The influences under which these phenomena are displayed are, more especially, temperature—and cold more than heat—emotion, visceral or internal reflex excitation, and the action of toxic agents formed in the organism or introduced from without.

The most striking and easily recognized phenomena are those exhibited by the heart and by the peripheral vessels (arterioles, capillaries, and venules); but analogy indicates that similar manifestations occur in the vessels of glands and viscera, while certain symptoms are only to be explained by disturbance of cerebral circulation. The stimulus that results in cardiac and vascular disorder may be applied centrally or peripherally, but the defective inhibition upon which the phenomena depend must be relatively central, and is probably the expression of functional or nutritional defect in the great ganglia of the sympathetic system, or in the medullary centres, or in both.

Functional and nutritional disturbance may result in structural, and finally in organic change; but the discovery of gross anatomical change at necropsy would not prove that it had existed from the first. It is likewise to be borne in mind that functional, nutritional, or structural defect in the sympathetic ganglia or nerves may be primary, or the result of primary or secondary disease elsewhere. The phenomena of vasomotor ataxia may thus occur independently, or be merely a part of the symptomatology of functional and organic diseases of various kinds. In either event the mechanism is essentially the same, and it will facilitate study to consider the circulatory symptoms apart from other complicating conditions.

With the pronounced types of vasomotor ataxia, to which at the one extreme—that of vascular relaxation—the name of Graves's disease or exophthalmic goitre, and at the other extreme—that of vascular tetany—the name of Raynaud's disease, local syncope, local asphyxia, acro-asphyxia, symmetrical gangrene, acrosphacelus, etc., have been given, all

are familiar. All are familiar, too, with the association of other phenomena of vasomotor paresis or vasomotor spasm with Graves's disease and with Raynaud's disease. For example, angina pectoris occurs in both, and angioneurotic œdema and spontaneous gangrene have been observed in Graves's disease. As pointing toward more than a superficial or accidental resemblance in such association of the two affections, the following two cases are submitted:

CASE I.¹ *Acro-asphyxia, with intermittent enlargement of thyroid gland, and paroxysmal tachycardia.*—Sarah O'N., unmarried; seamstress; aged twenty-five years; native of Ireland; having fair skin, brown eyes, black hair; was seen at the Philadelphia Polyclinic, April 11, 1892. For three or four months she has had almost constant headache, with occasional dizziness. Vision at times misty. The feet sometimes swell. At times she has pain in the precordium, with cardiac palpitation. These attacks occur paroxysmally. For about two years she has noticed that several times a day, especially if exposed to cold, either by immersion in cold water or otherwise, the fingers suddenly become discolored—purplish. Both extremities are affected at once. The discoloration begins in the palm of the hand, and extends downward. It lasts but a few minutes, and disappears quickly. The first phalanx of the middle finger of the right hand is thickened, the skin glossy, the veins much distended. There is a depressed cicatrix on its inner aspect. The patient states that twelve years ago there was a swelling at this place, which was lanced, and kept on discharging until within a few months, when the sinus finally closed. The bowels are constipated. The patient does not rise at night to micturate. Menstruation is irregular. Examination shows all over the arms mottled areas of irregular distribution, indicating by their varying color, and by the appearance of the distended vessels, both capillary and venous congestion. Over the upper part of the chest, anteriorly and in the back, especially beneath the scapulæ, are congeries of distended superficial venules. The legs and feet appear not to be affected. No lesion of the lungs can be detected. At the first examination of the heart the rate is 96. At the base a soft systolic murmur is heard, more distinctly on the left. In the veins of the neck a marked musical hum is heard, louder on the right. It is continuous, with systolic intensification. The thyroid gland is easily demonstrated, but not markedly enlarged. Hæmoglobin is 65 per cent. by Fleischl's scale; red corpuscles number more than 4,000,000; there is no excess of white cells. Urine is 1018, acid; no albumin, no sugar, no casts, no red cells (Dr. Eshner). The fundus of the eye is normal; there is compound hyperopic astigmatism (Dr. Jackson).

Relief of constipation, together with correction of visual error by glasses apparently relieved the headache. After a few doses of nitroglycerin, the local asphyxia did not return while the drug was taken.

Some three months later the patient returned, complaining of recurrent headache, with attacks of precordial pain and violent palpitation. The nature of these attacks seemed to be that of tachycardia rather than simple palpitation. While under examination the pulse-rate was variable, about 130. The thyroid gland was slightly enlarged, and a bruit could be heard over the gland on auscultation.

Picrotoxin, $\frac{1}{16}$ grain t. d., was prescribed, with apparent relief to headache. During some ten weeks the thyroid was observed to enlarge and diminish irregularly, without reference to menstruation, which occurred twice during the period. The swelling was soft, not expansile, and greatest on the right side. The patient was last seen some four months ago, when the thyroid gland was apparently normal; pulse-rate 96.

CASE II. *Epilepsy; acro-asphyxia; enlargement of thyroid gland.*—Mary N., aged nineteen years; domestic, unmarried; of American birth, Irish parent-

age; fair skin, brown hair, blue eyes; seen at the Philadelphia Polyclinic, January 4, 1893; has had mild epileptic paroxysms of about one half-hour's duration once a week, since the preceding October. There is no aura. She screams and turns pale before losing consciousness. The bowels are regular; the menses regular but painful. The patient is subject to paroxysmal flushing, with subjective and objective heat, especially of the face. There are irregular sweats. She has urticaria in summer-time. She is easily excited; and has frequent attacks of palpitation and rapid thumping of the heart. The heart is not enlarged; the impulse is jerky; the rate is 100; the first sound is short, the second sound is accentuated at the aortic cartilage and at mid-sternum. There is a soft systolic murmur over the sternum, near the articulations of the second cartilages; it is not transmitted. The thyroid gland is enlarged, especially in the right lobe; it is soft and pulsating; there is no thrill and no bruit. The hands are of a dusky-blue color, which slowly fades on elevation; the nails are purplish. Upon immersing the hands in ice-cold water they soon become red. If one hand only is placed in the cold water, that one becomes red, the other a deeper blue. Dermographism is marked. Factitious urticaria is produced by pressure, followed by cold.

The patient states that only recently has she noticed occasional blueness of the hands; that it is not constant, and is usually produced by cold, but may come on while at work in a warm room.

There are on the cheeks of this patient three or four small reddish elevations, surrounded by little radiating lines—a star, as it were—of dilated vessels. A number of small telangiectases are found on the arms and breast. She states that she bleeds easily if cut, but blood is stanching in a reasonable time. She frequently bleeds from the nose. No family history is attainable.

Taken by themselves, these two cases might not appear to be of special significance; but to me they were of great interest, because they seemed to supply the links between two groups of cases that had occupied my attention for a number of years, and which I believed to be related to each other, as to Graves's disease in the case of the one group, and to Raynaud's disease in the case of the other group; and thus to complete the chain of observation, as of reasoning. This will become more apparent if I relate briefly, but in some detail, the case that first drew my thoughts to the subject.

CASE III.—In February, 1885, Miss X., of American birth and parentage, Hebrew race; fair complexion, brown hair, gray eyes; an intelligent and truthful, and not hysterical young lady, some seventeen or eighteen years of age, apparently in perfect health, was alarmed at a sudden dimness of vision, progressing in the course of a few minutes to total blindness, which lasted "about a second." The return of sight was followed by intense headache, lasting about ten minutes. Ophthalmoscopic examination, some hours afterward, and at different times since, has never detected any abnormality.

Examination of the urine passed the morning following this attack showed the presence of a quantity of albumin too slight to be quantitatively estimated, a few leucocytes, a few uric acid crystals, many red blood-cells, and in one or two fields a hyaline tube-cast, or a mucous cast. This condition lasted for two or three days. The urine was acid in reaction, and 1015 to 1018 specific gravity; the quantity was normal. Inquiry revealed the fact that the patient blushed easily, and that in addition, without known emotional cause, there occurred at times what she termed "burning flashes," in which the skin at various areas, sometimes circumscribed, as to a cheek, sometimes generalized, would for a few minutes, or a few hours, become intensely red, with both subjective and objective sensation of heat. On one or two occasions the peculiar distribution of the red areas and their persistence for a day had led to a false domestic diagnosis of measles. But the repetition of the attacks, their

peculiar development and course, and the absence of all other morbid phenomena, soon proved the error. As a child, too, she was said to have had measles three times and rubella once. In one of these attacks that I saw, as the rash was fading, the skin of the arms, chest, and neck was covered with little pink spots, not elevated above the surface, the largest of which was no larger than an ordinary pin-head; and I was told that the rash began in the same way, but that when at its height it presented either as a uniform scarlet flush, or the mottled appearance simulating measles. On another occasion I saw the patient when the right cheek was the seat of a vivid blush, the left being apparently normal, and was told that the left cheek had been the blushing one some hours earlier. The flushed right cheek had a surface temperature of 97° F., the left cheek 95° F., while the axillary temperature was 98.4° F.

Over the middle portion of the left lower jaw this patient's skin invariably presents during menstruation an area of fixed blushing; that is, it is reddened in an oval patch about two inches long and half an inch wide, the color being deepest in the centre, and fading at the periphery into that of the surrounding skin. Her nails are slightly convex, pink in color, longitudinally striated, and exhibiting crescentic markings. She has been under observation continuously since the attack of blindness recorded, and during that time has presented, in addition to the flushes spoken of, an attack of erythema nodosum; several attacks of urticaria; one attack that I did not see, which appears from her description to have been a circumscribed oedema of the arm; and one that I did see, which was circumscribed oedema of the calves of the legs. The transient blindness has been repeated, affecting only one eye, however, and there was one attack of hemiopia, likewise transient, in which she did not determine which eye was affected, or whether both were involved. In 1889 an attack occurred, which (my notes being defective) she describes as follows:

"Having been in good health for two years, I awoke one night with a great desire to urinate; this was followed by a feeling of faintness and great pain in the heart—I must have been partly unconscious, as I walked down stairs without remembering how. When I became aware of my surroundings, there was intense itching of the palms of the hands and soles of the feet, and a trembling of the whole body, which, for some minutes, I was unable to control. In the morning there was a red blotchy appearance on the chest, lasting several hours, and welts on the wrists. I felt well, and had no pain. I remember that the urinalysis for the next six months frequently showed albumin, but I felt perfectly well and strong. The rash and the welts occasionally appeared."

The urine is for months normal, but occasionally shows a trace of albumin, uric acid crystals, casts, cylindroids, or hæmocytes. Sometimes all of these will be found together, sometimes albumin only, or blood cells only. General health and strength keep good, the eyes are emmetropic (Dr. Jackson), with large pupils, and the blood is normal. Though there are occasional attacks of palpitation, the heart, and so far as I can determine, the lungs and all the other viscera—for I do not believe there is organic renal disease—are normal. Menstruation, however, is irregular at times, and there is occasional dysmenorrhœa. The attacks described are not related with menstruation. The thyroid gland is demonstrable, but not enlarged.

The family history in this case is of great interest. It can hardly be a series of meaningless coincidences. The patient's father died of acute pneumonia, after having for forty years suffered with pulmonary hemorrhages, attributed to "disease of one lung," of what nature I do not know. Several paternal cousins have leucoderma; one has had renal colic, passing uric acid gravel; another, highly myopic, has obscure symptoms of disturbance of the sympathetic nervous system, diagnosticated by one observer as incipient Graves's disease; another has had chorea, and is very liable to epistaxis and to panaris; another, likewise highly myopic,

has had retinal hemorrhage; another has chilblains every winter, and is subject to sudden syncope from slight indigestion; another has blueness of the hands every winter, with tendency to deep fissuring of the fingertips, unless constantly protected by woollen mittens; another will get circumscribed œdema from slight knocks that in others would pass unnoticed, and that even in him do not cause discoloration of the skin. A paternal aunt, still living, is affected similarly to the father. A brother of the father's died at the age of thirty, of suffocation in the course of a pulmonary hemorrhage. His son has progressive myopia of high type. There is likewise a rheumatic tendency in this family; one of its members has had diabetes mellitus. The patient's mother is living and healthy, at past sixty years of age. Severe mental shock, however, not long ago prostrated her in bed for a few days, during which time the heart's action was feeble, excited, and irregular; the temperature was slightly subnormal; albumin, tube-casts, red and white blood-cells were found in the urine. I am satisfied that she has no organic lesion. Several members of her family have had diabetes mellitus—living, however, to advanced age, and two of her sisters and one niece have had carcinoma of the breast. There is also a gouty and a neurotic heredity in this family.

As further exhibiting the essentially constitutional basis of vasomotor ataxia may be briefly stated:

CASE IV.—A brother of the preceding patient, aged thirty-five years, dark-haired, blue-eyed, has been for some eight years the subject of ophthalmic migraine, and has attacks of spasmodic asthma if exposed to the emanations of feathers, or to moist atmosphere at the seashore. He has hyperopic astigmatism (Dr. Gould). His thyroid gland is slightly enlarged. He exhibits along the borders of the ribs the peculiar appearance which I have termed the *costal fringe*, namely, a network of telangiectases, following the outlines of the costal arches. This appearance is found in some cases of hepatic cirrhosis, but this patient's liver is apparently normal. He has no pulmonary or other visceral lesion, but is seized at times with gastric crises (pain relieved by vomiting), that appear to correspond with periods of lithuria and oxaluria. His urine has never shown albumin or casts; and red blood-cells have been found on but one occasion. His reflexes are normal, or perhaps slightly exaggerated.

These two patients, and a sister of theirs who is subject to profuse epistaxis, occurring without apparent cause, but is otherwise healthy, exhibit three symptoms upon which I would lay special stress:

1. *Dermographism*. That is to say if, with a blunt probe, and using very light pressure, letters or other device be traced upon the skin of the patient, especially upon the inner aspect of the limbs, or over the sternum, the tracings soon appear in a rosy-red tint that lasts for some minutes, or even half an hour.

2. *Factitious urticaria*. If in tracing upon the skin one uses a little deeper pressure than before, the red lines soon broaden, and finally the reddened portions show a more or less decided elevation, like the wheals of urticaria. In some cases the red color fades, in others it persists. The

elevation remains in some instances, notably in cases of chorea and of exophthalmic goitre, for several hours. When factitious urticaria is not immediately apparent upon the use of pressure merely, it may in some cases be quickly developed by applying cold to the part, as with a lump of ice; in other cases the application of hot water will cause it to appear. When cold or heat is applied, the wheals are always reddened, and sometimes a diffuse redness that slowly fades is likewise seen upon the intervening skin.

3. *A modified form of Stellwag's eye-sign of exophthalmic goitre.* When the patient looks fixedly before him, and opens the eyes, a distinct white rim of sclera is exposed above the cornea. It may be spontaneously exhibited in the excitement of conversation, or may have to be developed by the physician in the course of examination.

I lay stress upon these signs on account of their occurrence in Graves's disease. Unfortunately I have not been systematically employing these tests for much more than a twelvemonth, during which time I have not seen a large number of typical cases of exophthalmic goitre. I have records, however, of seven undoubted cases (one male, six females), in which dermatographism and factitious urticaria were marked; and, indeed, I have never seen factitious urticaria so readily produced, so persistent, or so striking, as in the case of a colored woman with exophthalmic goitre, in the wards of one of my colleagues at the Philadelphia Hospital. I may briefly record in this connection, as a case linking the preceding ones with those to follow, a case from my own service at that hospital:

CASE V. *Exophthalmic goitre with acro-asphyxia.*—(Notes taken by Drs. Claribel Cone and S. Stivers, resident physicians, Philadelphia Hospital, February 23, 1893.) Charles P., aged thirty-three years; waiter; native of Ireland; unmarried. His mother died of cancer of the breast, his maternal grandmother, of cancer of the nose; a maternal cousin, of phthisis. There is no neurosis in the family. The patient had the infective fevers of childhood. He has been a hard drinker. He had syphilis and gonorrhœa about twelve years ago. He has not had rheumatism. When a child he had attacks of palpitation of the heart, which ceased as he grew older. Twelve years ago he was occasionally attacked in the same way. Six years ago, after a debauch, more persistent rapid action of the heart developed, and has continued at intervals since. Attacks may be brought on by his being startled. The cardiac disturbance sometimes prevents sleep. It is accompanied with dyspnœa. There is no cough. For the same length of time he has been very nervous, easily frightened; his hands tremble, and at times there is a general tremor. The cardiac storms and general nervousness develop synchronously. He has occasionally spit blood—not sufficient to cause him to give attention to it. The present attack began about a month before admission. There is no pain, no anæsthesia, no motor paralysis. The eyes were always large, but have been getting more prominent for the last two years. Graefe's and Stellwag's signs are both present. Goitre has appeared and disappeared; no data of this are attainable. At present there is no demonstrable enlargement of the thyroid gland. The pulse-rate varies from 81, under treatment, to 140 without treatment. The cardiac impulse is not strong. There is no murmur. In the vessels of the neck, especially the jugulars, there is a marked musical hum. Examination of the blood shows: Hæmoglobin (Fleischl's scale), 30 per cent.; red corpuscles, 4,036,000;

white cells, 11,000. There is no pulmonary lesion. There is nothing abnormal in the urine. The patient has frequent cold sweats. The skin is usually warm and moist. The hands, from time to time, become bluish and cold. They are always moist. At times, after an attack of coldness and lividity, they become pink and warm. The attacks are independent of weather, and of the temperature of the ward, but can be induced by exposure to cold. The duration is variable. The patient has an irregular temperature, but no relation can be traced between temperature curve and paroxysms of acro-asphyxia. Dermographism and factitious urticaria are marked. The hands immersed in warm water (110° F.), become slightly red in about three minutes. In cold water (40° F.) they become quite red in two minutes. One hand being placed in cold water becomes red; the other, left free, becomes blue. White spots made by pressure on the bluish or reddened skin remain for a long while. Elevation reduces lividity slowly, but has no effect on the pinkish discoloration. The patient exhibits telangiectases at different portions of the trunk, and has a hard, pinkish, sessile growth about the size of a bean, on the left cheek.

Incidentally, it may be remarked that this patient professed to feel better and exhibited slight objective improvement during the administration of desiccated thyroid gland. The only abnormality observed in the urine was during this time, and consisted in an intense blood-red coloration. It did not respond to tests for hæmoglobin, and Dr. John Marshall kindly examined the specimen, and reported the color to be due to a modified form of indican.

Bearing the foregoing case in mind, the observation now to be recorded finds its place and explanation. The case is in many respects similar to one that I observed in 1886, at the Jefferson Medical College Hospital, and in which Prof. Bartholow concurred in my diagnosis of vasomotor paresis, as against cardiac hypertrophy. In the earlier case acro-asphyxia was not present; temperature was elevated during paroxysms of flushing of the face. There was much headache.

CASE VI. *Hæmoptysis; tachycardia; acro-asphyxia*.—I. H., aged sixteen years, of Russian birth and parentage; Hebrew race; dark skin, hair, and eyes; a poor boy, who during the day teaches languages to beginners, and at night, in a cold room, studies to fit himself for college, was sent to me by his attending physician, Dr. C. D. Spivak, February 26, 1893, with a note stating that for a week he had had daily hemorrhages, slight in amount, believed to be pulmonary, the blood being bright red and sometimes mixed with saliva. There was no cough, no expectoration. Physical examination revealed no pulmonary or laryngeal lesion. The heart was rapid (130) and forcible, but not demonstrably enlarged. The first sound was somewhat short, the second sound accentuated. The pulse was tense. The hands were discolored, the terminal phalanges being of a deep purple, the rest of the fingers and the dorsum of the hand being of various shades of pink, red, and blue, the palms being mottled red and blue. Elevation slightly lessened the color, and secured a more even distribution of shades. The thyroid gland was slightly enlarged, and there was a faint hum in the vessels of the neck. The pupils were widely dilated, and there was evidently great eye-strain; the patient complaining of headaches brought on by reading, and the left eye showing a tendency to wander. Later in the case, Dr. George M. Gould kindly examined the eyes, and found a high degree of compound hyperopic astigmatism, the eye-ground being normal. The urine has never contained albumin or casts, and red blood-cells were found on but one occasion.

The patient was put to bed, with regulation of diet and secretions; ice was applied over the heart, and tincture of aconite given until the pulse fell to 60. In the course of a week he was permitted to rise, when the pulse immediately shot up to 100. Dark glasses and paralysis of accommodation, adopted at Dr. Gould's suggestion, failed to quiet the heart. Suitable glasses were then prescribed, and aconite again administered until the pulse, in a

sitting posture, fell to 80. On stopping the aconite, tachycardia again manifested itself. Examination of the urine showed nothing abnormal. Examination of the blood showed corpuscles and hæmoglobin about 75 per cent. The accentuation of the second heart-sound, and the high pulse-tension now received the consideration that perhaps they should have had earlier. Aconite was stopped, and nitroglycerin given in ascending doses until physiological effect was manifested. The pulse-rate fell to 80 in the sitting posture, 90 in the standing position. It was still further increased upon exertion. Aconite was now given in conjunction with nitroglycerin, and tincture of chloride of iron administered concomitantly. Under this treatment, with gradually decreasing doses of aconite and nitroglycerin, the pulse has become steady at about 80. There has been no further hemorrhage. No sign of pulmonary lesion is to be discovered. There has been no history of rheumatism. While in the house, the room being kept warm, the discoloration of the hands faded to a light duskiness. While going about in cold weather, the condition previously described returned. The hands sweat profusely at all times, even in cold weather. Since warm weather has set in the hands have become normal in appearance. The patient exhibits dermatographism, factitious urticaria, and the eye sign already described. The pupils are persistently and equally large.

CASE VII. *Oedematous acro-asphyxia*.—The brother of the preceding patient, a peddler, a native of Russia, aged twenty-three years; is subject to chilblains. I had one opportunity to examine him—July 17, 1893—a warm day. The hands were of a dusky color, mottled red and bluish; the nails purplish, and exhibiting the peculiar crescentic markings. There was considerable sweating of the hands; he says that they get almost black in cold weather, and sometimes when not cold. At times they suddenly swell, and then often become dark blue. The swelling lasts a few hours, rarely a day. Sometimes there are white patches on the hands when they are otherwise blue. The duskiness present on the occasion of my examination lessened on elevation. The heart was strong; there was no murmur; pulse 84 in sitting posture, somewhat tense.

There was mydriasis; the sclerotic was exposed upon opening the eyes. Dermatographism and factitious urticaria were present. The hands trembled on being held out for a short time. This was said to be of frequent occurrence. The thyroid gland was not demonstrable. There was no history of cardiac palpitation. This patient likewise has hyperopic astigmatism.

Additional cases might be narrated were it necessary (and some will be published hereafter), in which what we may, for convenience of designation, call the Graves group of phenomena and the Raynaud group of phenomena are mingled in varying degree. But those selected are sufficiently indicative of the gradual transitions by which two diseases, apparently so opposite in their nature, may be brought under one clinical generalization. Leaving now the Graves group, and those cases that stand on the far side of it, I desire to briefly submit some interesting cases on what we may call the hither side of the Raynaud phenomena; and it will be found, I think, that gradual transitions may also be traced here down to normality, which, like the sigil, completes our ring.

CASE VIII. *Anæmia; hæmatemesis; gastric ulcer (?) ; acro-asphyxia*.—Mary T., aged seventeen years; of American birth and Irish parentage; fair skin, dark hair, gray eyes; syphilitic inheritance; was under my care in 1888, for profound anæmia with hæmatemesis and symptoms suggestive of gastric ulcer, and recovered under treatment based on such a diagnosis. Early last winter she returned, rosy in hue, without anæmia, but again complaining of spitting blood. Her hands were of a deep-blue color, which was

unaffected by position. I sent her to a friend to have her hands sketched, and on the way to his office they resumed a normal color. Frequently during the cold weather they would become red or blue, or mottled red and blue. On severe exposure they once became dead white, and were excessively cold. When blue, the hands are subjectively and objectively cold; when red they are objectively warm, but subjectively cold. The same changes take place in the feet. Both hands and feet sweat profusely. Capillary pulse was seen in the lips and nails. Occasionally she has a film before her eyes. There is no lesion of the eye-ground, but glasses are worn for relief of headache (myopic astigmatism, Dr. Jackson). There is no cardiac or pulmonary lesion. The thyroid gland is not abnormal to palpation. The pulse is 80, and of low tension as shown by sphygmogram. Examination of the blood showed hæmoglobin, 80 per cent; corpuscles normal. The urine contained a few red corpuscles.

CASE IX. *Hæmoptysis; tuberculosis; acro-asphyxia*.—M. M., a drug clerk, a native of Russia, of fair complexion, light hair, blue eyes, applied at the Philadelphia Polyclinic, February, 1893, on account of pulmonary hemorrhages. Attention was attracted to the blueness of his hands. This was said to have manifested itself while out of doors during cold weather for several years, and to slowly fade into a pinkish tint while the patient remained indoors. Elevation caused very gradual disappearance of the discoloration. The heart was normal. There was found slight dulness and crackling at the left apex, and large and small mucous râles over both sides of the chest. After repeated examination of the sputa a few tubercle bacilli were found. The patient stated that his mother's hands were similar to his, as were also those of one sister and one brother younger than himself. His father and his elder brothers and sisters did not exhibit it. The sister and brother who had blue hands were quite subject to bleeding from the nose; with the sister, epistaxis ceased with her first pregnancy.

This patient showed dermatographism and factitious urticaria. There was no cardiac lesion, and no abnormality of the thyroid gland. His hands and feet were constantly sweating both in hot and cold weather. He had paroxysms of polyuria. His urine while under observation showed occasionally red blood-cells, no albumin, no sugar, no excess of urates. He has myopic astigmatism (Dr. Jackson). Under treatment, with rest and calcium chloride, the pulmonary hemorrhages ceased, and the hands improved while kept wrapped in cotton, and treated daily with a descending galvanic current.

In these cases of blue hands, and in many others of which I have record, there is a striking series of phenomena to be observed, which I have not thought it necessary to relate in detail in each case. If, during a period of quiescence, that is to say, in warm weather, or after the effect of treatment or of the warmth of the room has made the hands somewhat less blue, one hand be placed in ice-water, it will, in a few minutes, become a bright red, while the other hand, not exposed to local cold, becomes a deep blue. Control observations on normal hands do not show the same result. If, during an attack of local asphyxia, the blue hands be placed in warm water, one of two things may occur: 1st. The hands may quickly become red. In that event, on removal from the warm water the red fades to a dead-white, then the normal color returns, then an abnormal blueness. Stroking the hands, either up or down, increases the rapidity with which the whiteness develops—and in some few mild cases, stroking alone, without resorting to immersion in cold water, will produce it. 2d. In other cases the hands become white on immersion in warm water, and red or pink when removed

into the air. In all cases, whether the hands be blue, pink, red, or mottled, pressure produces a whiteness which does not quickly disappear. In some cases the experiment was made of immersing the blue hands, during an attack, in cold water. They would either become red and warm, or almost black and intensely cold.

I have alluded to the appearance of the finger-nails. Setting aside the well-known appearance in typical Raynaud's disease and that produced by panaris, to which latter affection these subjects seem quite prone—I have observed many varieties that fall into two groups: a clubbed finger-end, with broad and flat, or Hippocratic parrot-beak nail; and secondly, a tapering finger-end, with long and transversely curved nail. The nails are usually striated, sometimes thickly ridged longitudinally. They are sometimes a bluish, sometimes a purplish, sometimes a pink color. The broad, flat nails are more frequently a leaden blue; the long nails, more often pink. Both the pink and the blue nails exhibit crescentic markings. In the pink nails there is usually one narrow and deep-red crescent between two wider and whitish crescents near the tip. The flat, leaden-colored nails usually show one wide, whitish crescent centrally. These markings differ from the whitish or reddish discoloration produced by varying pressure in normal persons.

To resume the development of our circle of cases, I have now to submit two instances that would be merely curious in themselves, but find place and explanation through each other, especially in relation with the cases of hæmoptysis and hæmatemesis recorded, and with the occurrence of blood-spitting in Graves's disease. I have seen two cases of hæmoptysis in exophthalmic goiter, in both of which pulmonary tuberculosis finally developed.

CASE X. Paroxysmal numbness of extremities; chlorosis; hæmoptysis; pulmonary tuberculosis; acute hemorrhagic varices (?) of pharynx.—Miss V., of American birth and parentage, Scotch descent; fair complexion, brown-gold hair, gray-brown eyes; not hysterical; first had indications of numbness in the left hand and arm on nearing the menstrual period at the age of fourteen years. Previous to this she had enjoyed good health, with the exception of an abscess on the left side of the neck, at the age of eight, and frequent paroxysms of hard, barking cough. She was subject in warm weather to an eruption on the hands, which was relieved by applications of black wash. The frequency of the attacks of numbness and their extent continued to increase until the age of twenty, when the patient was treated for anæmia. She had then had no menstrual period for six months, had lost flesh, was very pale, had cough, and constant headache. At this time the patient came under my care (1883) for pulmonary hemorrhages with fever, and physical signs of tuberculous infiltration of left apex. Under treatment complete recovery ensued; the menses appeared and the general tone of the health was restored. The numbness disappeared for about four years; when the attacks returned, and still occur, with not so much frequency but more severity, and affecting likewise the tongue and throat. The face becomes very pale; the arm and hand seem perfectly lifeless, and can be placed in almost boiling water. When feeling is restored a violent headache follows, and the patient is weak for two days. The attacks generally follow disorder of the stomach or mental disturbance, or occur about the menstrual period. At times, not connected with the attacks of numbness,

there occur in the throat during glutition, what she terms "blood-blisters," which consist of little bluish elevations about the size of half-a-pea, and apparently of the nature of varices, that when ruptured, artificially or spontaneously, discharge black blood. Her sister is subject to similar but larger "blood-blisters," which, however, do not always discharge themselves, and it is said that it is sometimes necessary to puncture them to prevent suffocation. Her grandmother was liable to attacks of numbness, from about the age of thirty until the age of eighty.

This patient exhibits dermatographism, factitious urticaria, and the eye-sign. Her nails are curved, pink, marked with crescents. She has hyperopic astigmatism (Dr. Turnbull). The thyroid gland is not enlarged; there is no heart lesion.

CASE XI. *Blue œdema of pharynx and uvula, with urticaria of fundament; angio-neurotic œdema of trunk and face; paroxysmal tachycardia.*—Mrs. B., aged sixty years, on June 26, 1892, complained of sudden dyspnœa of a few hours' duration, and soreness of the throat. For a day the patient has had urticaria of the fundament. She is subject to this form of urticaria at irregular intervals. The uvula is swollen, more upon the left, and the mucous membrane is of a grayish-blue color; the left posterior palatine fold is similarly discolored and œdematous. The swellings pit upon pressure. Scarification gives exit to less than a drachm of black blood. Two or three days ago the patient had, without known exciting cause, an attack of sudden violent beating of the heart. She became quite faint, and lay down, and in the course of about half an hour the heart became quiet. An attack less violent and of shorter duration occurred later in the day. The attacks were accompanied with flushing and heat of the entire body. The patient has not menstruated for some years. She has had similar attacks previously. The first followed a mental shock twenty years ago. The attacks usually last twenty-four hours. Different portions of the body are swollen. Once the œdema occupied half the face; at another time half the abdomen. On three occasions it has begun in half the lip, afterwards extending to the whole structure. The tongue has been swollen.

Her urine, examined on the day following the attack reported, was amber in color, turbid, acid reaction, specific gravity 1019, containing no albumin, no sugar; leucocytes and red cells were present.

The patient exhibits dermatographism and factitious urticaria. She is not specially susceptible to cold. Her family, while long-lived, is gouty and neurotic. One of her daughters has aggravated hysteria. One sister has diabetes mellitus. This sister likewise exhibits dermatographism and factitious urticaria, and as a child and young woman was subject to paroxysmal flushing of one cheek.

The following case will serve as a transition to a comparatively large group, in which digestive disorders are prominent.

CASE XII. *Hysteria; burning and coldness of extremities; herpetic (?) eruption; hungry dyspepsia; exophthalmos.*—July 11, 1892. Mrs. R. O'D., a typical brunette, of American birth, French parentage, aged twenty-five years; complains of subjective and objective coldness of the legs below the knee, for a week. There is cold perspiration of the feet. For a year the patient has been feeling worn out and languid. During this time the hands have been swollen, red, and burning when she rises in the morning. The redness passes off quickly.

Sometimes there is a similar condition for half an hour toward evening. The patient is hysterical and easily frightened—the heart palpitates violently when she is nervous or excited. For three months subjective vertigo has occurred at irregular intervals. There is no dimness of vision; she sees neither flashes of light nor dark specks. Ten years ago she had "fainting spells," in which, however, she did not lose consciousness. She became dizzy, then clenched her teeth and hands, and fell; the image of the last object seen remained impressed on the retina. The attack lasted a few minutes; there was no convulsion, no subsequent drowsiness. There have been six such

attacks in one day; they have become less frequent since marriage; the last was six months ago.

About a year ago there would, from time to time, appear on the legs and disappear after about two days, a papulo-vesicular eruption associated with itching. It did not pustulate and dried without scabbing. The bowels are constipated. There is headache. Sometimes there is pain referred to the stomach and relieved by eating. There is no nausea, no vomiting, no pyrosis. Appetite is excessive. There is no polydipsia. The urine is excessive in quantity, and the patient rises at night to urinate. Menstruation is irregular. The eyes are prominent, the eyelids tremble when closed. The sclera is exposed when the eyes are opened. The reflexes are all exaggerated. The heart is irregular, not specially rapid; no murmur. The thyroid gland is not enlarged. Urine: acid, 1013, no albumin, no sugar; numerous disks that may be decolorized red cells. (Dr. Eshner.)

The phenomena of disturbed and incoördinate circulation are often even more strikingly manifested in the cases diagnosticated of recent years as "neurotic dyspepsia" and "neurasthenia." In this connection I will briefly enumerate the salient features only, of two additional cases.

CASE XIII. *Neurasthenia; lithæmia; vertigo; membranous enteritis*.—Mr. J., aged thirty years; attorney; American Hyperopic astigmatism; nausea; no vomiting; paroxysms of vertigo, with pallor, chilliness, and sweating; aggravated neurotic dyspepsia; lavage proves absence of morbid secretion; emaciation; inability to attend to business; morbid attention to symptoms; no heart or lung lesion; throbbing and murmur in abdominal aorta; exaggerated reflexes; mottled hands; pink, crescent-marked nails; dermatographism, factitious urticaria; eye-sign; paroxysms of polyuria. Urine contains no albumin, no sugar; at times leucocytes, red cells, uric acid, calcium oxalate, phosphates. Patient has membranous enteritis. Has had attacks of urticaria; is extremely susceptible to both heat and cold; hands and feet frequently become cold without apparent cause. His child has a curious mottling of the skin of the trunk and limbs that resembles measles. At times it is of a vivid red, at others it fades to a delicate pink or faint brown.

CASE XIV. *Hysteria in a male, with neurotic dyspepsia, hæmatemesis, paroxysmal flushing, and sexual crises*.—The principal points in this case, of which space forbids a full report at present, are as follows: The patient, a merchant, aged forty-five years, and happily married, is highly emotional and of an hysterical family. He is stout, heavily built, with red cheeks, and dusky-pink hands. His nails are of the leaden-blue variety. Dermatographism, the eye-sign, and the costal fringe are present. Factitious urticaria can readily be produced, and the patient has had hives repeatedly. He is quite susceptible to moderate heat, flushing and perspiring when others feel comfortable. He has a habit of working feverishly, and is an interminable talker. After a period of overwork his digestion fails. He has burning pain in the stomach, with excessive thirst, and inability to retain anything except iced liquids. There are crises of gastric and abdominal cramp with vomiting—at times vomiting of blood—with serous diarrhœa, and at times passage of membrane. He does not use alcohol or tobacco, and always has been chaste. At times when suffering with indigestion, he will have sudden sensations of heat in the head and coldness below the knees; or general heat followed by chilliness; which, as he lives in a malarious region, has been called malaria. A peculiarly distressing form of the paroxysm is a feeling of heat beginning at the navel and spreading over the body, with pain in the testicles and unnatural sexual imaginings provoked by the sight of a strange man or woman "perhaps ugly as Satan;" his face becomes dusky red and his whole body trembles. This is followed by insomnia, anorexia nervosa, and finally for two or three nights by excessive nocturnal micturition, the urine being colorless as water. Such urine has a specific gravity of about 1002, and contains nothing abnormal. His ordinary urine contains neither albumin nor sugar. On two occa-

sions colorless blood-cells were found in large quantities. His blood is apparently normal, and when examined in Philadelphia during a paroxysm of subjective heat, without elevation of general temperature, malarial organisms could not be found. Lavage proved entire absence of gastric catarrh, and examination of stomach-contents after test-breakfast showed absence of free acid with diminished total acidity. The eyes are normal. The knee-jerks are sluggish. The heart is slow (60) and feeble; dilatation not demonstrable. There are attacks of palpitation with dyspnœa. The abdomen is not sensitive to pressure. Hepatic dulness is normal. The splenic dulness is not enlarged.

In some cases of vasomotor ataxia there is a pronounced idiosyncrasy toward drugs; the most remarkable instance I have seen being the following:

CASE XV. *Paroxysmal headache and vertigo; circumscribed œdema caused by strychnine and by picROTOXIN.*—Mrs. E. S., aged forty-seven years; of American nativity and parentage; dark hair and eyes; full habit, flushed face; was seen in April, 1890. She complained of paroxysmal headache, subjective vertigo, and flushes of heat; the symptoms being of several years' duration. There is no visual disturbance. Headache and vertigo occur together or independently. The headache is not localized, but sometimes there is a feeling as of whirling inside the skull, in the vertical region. At times there is a sensation as of cold water being poured down the back. There is no rheumatic or other personal or family morbid history. The patient is regular in menstruation. There is no indigestion, but the bowels are inclined to be constipated. The thyroid gland is not enlarged; there is no thrill or bruit. There has been no urticaria, nor can factitious urticaria be produced. Dermographism is marked. The nails are pink and purple; they are striated and exhibit pink and white crescents. The hands are always warm, frequently sweating. The feet are cold even in warm weather; at times there are paroxysms of icy coldness, without loss of sensation or change of color. The urine is scanty, less than a quart in twenty-four hours; it contains nothing abnormal. The pupils are much dilated. Dr. Hansell examined the eyes, and reports "presbyopia, no lesion of fundus, veins overfilled." The heart is slow and steady (rate 60), the pulse is full but not strong; superficial veins are not prominent. Strychnine ($\frac{1}{80}$ grain t. d.) administered medicinally caused marked œdema of the face. The patient recalled a previous experience of the same kind. Nux vomica and picROTOXIN caused similar effects. Hyoscyamine relieved the headaches; alkaline diuretics increased the urine. The patient improved, but passed out of observation. August 31, 1893, she reported at request. She is going through the menopause. The flushes of heat are more frequent. The head, neck, chest, and arms to the finger-tips become red. The redness passes off in a few minutes. Sometimes it is accompanied by a numbness of the left hand and arm, and tingling with coldness in the last two phalanges of all the fingers. Sometimes the numbness will last for two hours after the redness has disappeared. A second flushing may occur before the numbness ceases. There is no periodicity in these occurrences. Perhaps they are worse when constipation exists. The hands are usually warm and moist, the feet cold. Immersing one hand in ice-water it becomes quite red and slightly swollen. The wrist and forearm become blue in patches, with marked distention of venules. The hand is objectively cold, subjectively warm. The other hand is not changed in color, but quite cold. On removing the red-den hand from the cold water the finger-tips first become white and numb, but after a few minutes redness returns, with a sensation of pins and needles, and both subjective and objective warmth.

Not now to detail additional instances, it may be stated that among other morbid associations found in cases of the same general character as those reported have been ecchymoses, petechiæ, hæmaturia, retinal

hemorrhage, organic heart lesion, organic kidney lesion, chorea, rheumatism, hay fever, paroxysmal engorgement of turbinate bodies, angina pectoris and pseudo-angina and glycosuria. In one case hæmoptysis occurred only during epileptic paroxysms; in another case of epilepsy, tachycardia and flushed face accompanied the convulsion. In both these cases there was a soft enlargement of the thyroid gland.

The obscurity in which the pathology of diseases of the sympathetic, or, to use Gaskell's term, the visceral nervous system, is still involved, cautions against premature assertion of other than clinical facts.

I believe that the phenomena herewith submitted for consideration are of considerable clinical significance.

Leaving out of consideration for the present, the diseases other than exophthalmic goitre (acromegalia, myxœdema) known to be associated with abnormality of the thyroid gland, there are four affections of great moment in which functional or structural alteration of some portion of the visceral nervous system is an important element, if not the essential feature. These are Graves's disease, Raynaud's disease, Addison's disease, and certain forms of diabetes mellitus.

The cases here reported show the existence of lesser degrees of disturbance of that system; and indicate that in some instances, at least, there is a congenital tendency to such disturbance. They suggest, moreover, that this congenital want of balance in the circulatory apparatus may be the germ from which, under the fructifying influence of various exciting causes, the more serious disorders develop. Thus mental or even physical shock in a subject of congenital vasomotor ataxia might cause the sudden development of exophthalmic goitre; and an exposure to cold from which a normal individual would quickly react, causes, in the subjects of this condition, local asphyxia, chilblains, frost-bite, or even extensive gangrene. So too, slight indigestion, itself the result of influences that would be ineffectual in a normal individual, may, in the subjects of vasomotor ataxia, induce crises of vertigo, migraine, syncope, or even paroxysms of epilepsy. And similarly, other sources of peripheral irritation—eye-strain, nasal abnormality, exposure to pollen, and the like, result in the production of an exaggerated reaction. The relationship of hay fever with the group of cases under consideration, may be best exhibited by comparing two of the descriptive names it has received—"idiosyncratic coryza" (J. Solis-Cohen) and "periodic vasomotor coryza" (J. N. Mackenzie). One of my patients with blue hands, was compelled to give up his position in a drug house because of his excessive susceptibility to ipecacuanha.

The occurrence of diabetes mellitus in members of the families of patients exhibiting the phenomena of vasomotor ataxia; of intermittent glycosuria in one of my cases of menstrual migraine with urticaria and almost constant flushing of the face; and of intermittent polyuria in

many of my cases, are circumstances worthy of note—especially in relation with the occurrence of glycosuria in some cases of Graves's disease, and with the investigations of Thiroloix upon pancreatic diabetes.

The tendency to hemorrhage must not be overlooked, especially in connection with the diagnosis of pulmonary tuberculosis, of gastric ulcer, and of hypertrophy of the heart. Cases such as those I have reported may develop tuberculosis or cardiac hypertrophy, but these conditions need not necessarily be present at the time of hemorrhage, or later. I would call especial attention to the extraordinary frequency with which, in cases of vasomotor ataxia, red blood-cells are found in urine not discolored—a fact rendered significant to my mind by personal observation of hæmaturia in a case of undeveloped Graves's disease that later exhibited the symptoms, and by the records of hæmaturia and hæmoglobinuria in Raynaud's case. The single case of paroxysmal hæmoglobinuria from cold that has come under my observation was not studied from the standpoint of the present paper, and is not available for comparison. In this connection, too, an interesting relation with hæmophilia, and with the purpuric group of affections is suggested; but it would not be advisable at present to more than indicate this subject.

The frequent association of refractive errors, and especially of hyperopic astigmatism, with instability of the circulatory equilibrium, raises the question whether the ocular defects are to be classed in the category of exciting causes acting by reflected irritation, or whether there is a more fundamental relation. I am inclined to the opinion that abnormality of circulation and nutrition bears a causative relation to the ametropia. The eye-strain may then react additionally upon the centres, increasing their irritability.

Finally, as exemplified by the case which first drew my attention to the subject (Case III.), and by the case last reported (Case XV.), we must recognize a class of cases to which, as yet, no definite nosological place has been given, and in which a varied symptomatology of circulatory disorder cannot be referred to disease of any organ; though lesion of the digestive tract, of the kidney, of the heart, or even cerebral or spinal lesion may be suggested. For these cases, depending as they must, upon a want of control in the nervous system governing the calibre and tension of the vessels, a defect clearly of inhibition, and by the radius of its effects evidently central in location, it seems to me that the most appropriate name is *vasomotor ataxia*.

SUMMARY.

1. By the term *vasomotor ataxia* it is proposed to designate the condition of instability of the mechanism of circulation present in certain persons and characterized by abnormal readiness of disturbance with

tardiness of restoration, of the equilibrium of the cardio-vascular apparatus. The manifestations are most strikingly displayed by the heart and by the peripheral vessels of the extremities, but analogy indicates the occurrence of similar phenomena in the vessels of the glands and of the viscera, more especially in those of the kidney, of the gastro-intestinal tract, and of the brain. They may occur apparently spontaneously, but often there is a recognizable exciting cause. Among the influences acting as excitants, are temperature, especially cold; toxic agents formed in the body, or introduced from without; visceral or internal reflex excitation; and emotion. The stimulus may be applied centrally or peripherally, but in either case the resulting phenomena indicate a defect of central inhibition; the expression, probably, of functional or nutritional aberration in the great ganglia of the visceral nervous system, in the medullary centres, or in both. The morbid anatomy is uncertain, and the results of necropsies necessarily inconclusive.

2. Vasomotor ataxia may be acquired as a sequela of disease; in many cases it is congenital; in some cases inherited; the condition is not rarely present in several members of a family.

3. In some cases the phenomena are of paretic, in others of spasmodic character. Usually the two kinds of phenomena are displayed in varying degree in the same patient. Whether spasmodic or paretic the symptoms are suggestive of incoördination. They are always in some degree paroxysmal.

4. In exophthalmic goitre, especially such cases as are produced by emotion or are markedly intermittent, is found the extreme type of the "relaxing" variety of vasomotor ataxia.

5. The form of Raynaud's disease, known as "local syncope" furnishes an extreme type of the "constrictive" variety; while "local asphyxia" exhibits phenomena of both abnormal relaxation and abnormal constriction of the vessels.

6. Between these extremes are numberless gradations down to the slightest departure from normality; while even the extreme symptom-groups represent merely exaggerations of phenomena that under certain conditions occur in normal individuals.

7. Dermographism is an essential feature of vasomotor ataxia, and in most cases factitious urticaria can be readily produced by cold or by pressure or by both; mottlings of the skin, certain peculiar markings of the nails, telangiectases, and stigmata are common.

8. There is usually a hemorrhagic tendency, as shown by ecchymoses, petechiæ, epistaxis, hæmoptysis, hæmatemesis, hæmaturia, and retinal hemorrhage.

9. Even in the absence of hæmaturia, red blood-cells are often found in the urine; uric acid, urates, and oxalates are likewise common; the

presence of albumin, tube-casts, and cylindroids is less common, and is usually intermittent. Glycosuria has been observed.

10. In many striking cases there has appeared to be morbid alteration of the thyroid gland.

11. The action of the heart is usually rapid, irregular, and easily disturbed; palpitation is common, and intermittent tachycardia has been noticed. Hæmic and functional murmurs are not uncommon.

12. Among other symptoms and morbid associations observed are anæmia, hysteria, drug idiosyncrasies, urticaria, local œdema, hyperidrosis, angina pectoris and pseudo-angina, organic heart disease, pulmonary tuberculosis, asthma, hay fever, vertigo, migraine and other forms of headache, transient hemiopia and other visual disturbance, persistent mydriasis, astigmatism, myopia, hyperopia, menstrual irregularities, intermittent polyuria, rheumatism, rheumatoid arthritis, contractures of digits, chorea, epilepsy, neurasthenia, neurotic dyspepsia, gastralgia, enteralgia and membranous enteritis—most of which are doubtless fundamentally related, as effects of a common cause, or as secondary results.

13. In making the diagnosis of simple vasomotor ataxia, it is necessary to exclude primary organic disease. The occurrence of such disease later does not invalidate the original diagnosis. The development of pulmonary tuberculosis in some cases is probably a sequence of vascular and trophic disturbance in the lung. Cardiac hypertrophy and renal lesion may likewise be among the results of disordered circulation.

TOXÆMIA OF PREGNANCY: ITS DIAGNOSIS AND TREATMENT.¹

BY EDWARD P. DAVIS, A.M., M.D.,

PROFESSOR OF OBSTETRICS AND DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC;
CLINICAL LECTURER ON OBSTETRICS AND GYNECOLOGY IN THE JEFFERSON MEDICAL
COLLEGE; VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.

By the term *toxæmia of pregnancy* we understand a condition occurring in the pregnant woman in which toxic material is present in the body in excess. There can be no nutrition without the production of waste, and when the dual existence in the body of the pregnant patient is considered, it is not strange that an additional quantity of waste products is present. The excretion of this material is effected largely through the agency of the kidneys, and hence attention was first attracted by those cases where kidney failure was the first and prominent symptom; but as our knowledge of pathology is increased, we see that

the kidneys are but partially involved, and that we must look farther in order to understand the condition.

The mode of production of the toxins, or poisonous waste, which threaten the pregnant woman, is not clearly explained. The usual metabolic processes account for a portion of the material present, while a certain number of cases point strongly to an acute intoxication with the products of bacteria. While the chain of evidence in the latter is not complete, they offer a most suggestive explanation for conditions hitherto not understood. It is the purpose of the present paper to consider methods of clinical investigation which have been found useful in the diagnosis of toxæmia, to mention agencies proven efficient in treatment, and to report illustrative cases.

The clinical investigation of the action of the kidneys during pregnancy has received so much attention that we omit reference to methods of examination commonly in use. It is especially important that the amount of urine secreted be carefully estimated; and while this is practicable in hospitals, ingenuity and patience must be exercised in private cases where a trained nurse is not at hand. The value of microscopic examination of urinary sediment can scarcely be overestimated in the study of pregnant patients. In the cases furnishing a basis for this paper we have examined the urine to ascertain its specific gravity, color, reaction, the presence or absence of albumin, of glucose, lactose, and urea. The two constituents especially important I consider to be urea and sugar or acetone.

As regards the examination for urea, the method is based upon the action of bromine upon sodium hydrate, the urinometer employed being that designed by Lyons. The significance of urea in the urine during pregnancy lies in the fact that it furnishes an index of the amount of waste which the patient is excreting. The literature of the subject furnishes abundant proof that solutions of urea may be injected into animals without causing convulsions; it is also true that a patient may endure a temporary suppression of urine which is almost complete, may escape convulsions, and recover; but the fact remains that the percentage of urea in the urine of the pregnant woman is a valuable indication of the efficiency of her excretion by means of the kidneys. It has been my custom to estimate the percentage of urea before and after labor, and wherever the percentage of urea has fallen below 1.5 we have found occasion to stimulate the patient's excretory processes, with a distinctly favorable result in all cases where symptoms of toxæmia were present.

The following fatal case of eclampsia well illustrates the fact that eclampsia may occur while the urine shows little abnormality, except deficient urea:

S. H., colored, aged nineteen, was seen by the resident physician of the Jefferson Maternity on June 21st at her home. She was pregnant

for the first time, in the ninth month, her foetus occupying the first position. The patient's legs were very oedematous, tense, pitting upon pressure; the right labium was enlarged to the size of an orange, and the patient complained of frequent micturition, constipation, and great discomfort. She was ordered a saline purge daily, and Basham's mixture as a tonic. The resident physician was again summoned to the patient on June 25th, finding her in labor. As she then consented to go to a hospital, she was brought to the Maternity in an ambulance. Her labor was rapid, although the head remained upon the perineum for about an hour, while the labia became exceedingly oedematous. The child was a female, weighing six pounds, and apparently healthy. Labor terminated at 9.40 in the evening; at 1.40 the next morning convulsions occurred; these were treated by hot packs, chloral and bromide, digitalis, calomel, and other agencies, as indicated by symptoms. The patient's convulsions continued, and death occurred fifteen days after her delivery. A post-mortem examination was unfortunately impossible. An examination of her urine was made during the time of her eclampsia, and before eliminative treatment had modified her condition. Its results are appended:

Chemical.

Date.	Color.	Specific gravity.	Reaction.	Chlorides.	Serum albumin.	Sugar.	Urea.	Remarks.
June 26	Yellow.	1002	Acid.	Normal.	50 ct.grm. to litre.	None.	0.2 per ct.	
" 27	Yellow.	1004	"	"	25 ct.grm.	"	0.8 "	12.30 A.M.
" 27	Yellow.	1008	"	"	Trace.	"	1.4 "	4 A. M.
" 27	Reddish-yellow.	1012	"	"	Trace.	"	1.4 "	3 P. M.
" 28	Reddish-yellow.	1004	"	"	None.	"	2.1 "	

Microscopical.

During the first day of attack the urine contained a few leucocytes, or pus-cells; amorphous urates; a few crystals of calcium phosphates. Leucocytes disappeared in later examinations. The usual bacteria were found; in the first slide examined there was *one* compound granular cast. As a whole, the urine was that of the ordinary pregnant woman, with a lower percentage of urea.

In 84 cases in which a total of 564 examinations was made (*i. e.*, 331 before labor and 233 after parturition) the average percentage of urea was found to be 1.4 per cent. before labor. It was noticed that in the majority of cases the amount of urea increased after the delivery of the patient, the average being 1.9 per cent. On the other hand, marked diminution in the quantity of urea occurred only in cases either having, or threatened with, eclampsia, or manifesting symptoms of marked toxæmia.¹

Symptoms of toxæmia which called for active treatment were a gradual diminution in the excretions of the patient, both solid and liquid; diminu-

¹ The urinalysis in these cases was the work of Dr. Wm. H. Wells, Assistant Demonstrator Clinical Obstetrics, Jefferson Medical College.

tion in appetite, with complaint of slight nausea or gastric distress; headache, a clammy skin, or, in some instances, a dry skin with deficient perspiration, and lassitude, mental and physical. The patients under observation were all expected to do light housework up to the time of labor, and hence a good opportunity was afforded to judge of the occurrence of lassitude. The case of S. H., just narrated, afforded no such opportunity for diagnosis, as she entered the Maternity already in labor.

In the study of these cases we have not regarded the presence or absence of serum albumin as indicating toxæmia. Where a microscopic examination of the urine showed the presence of casts and epithelium, the concurrent presence of albumin was, of course, significant; Eshbach's albuminometer we found convenient and practically accurate; but where the microscope failed to find pathological elements, and albumin was present, it was not regarded of importance. In about one-half of the patients, sugar was present at irregular intervals during pregnancy and the puerperal state. It was found in small quantity, and usually in the form of lactose or glucose. The test most useful in its determination was that of fermentation; subnitrate of bismuth and the use of Fehling's solution were also regarded as valuable adjuncts. The presence of glucose and lactose bore no direct relation, so far as we could observe, to a toxic condition of the patient. Lactose was frequently more abundant as the secretion of milk became established. In cases of toxæmia, however, glucose was present, and possibly acetone would have developed had excretion not been freely stimulated.

Of especial interest in considering the question of toxæmia in the pregnant and puerperal state is the relation which bacteria and their products may bear to the pathological condition present. The following case furnishes an illustration in point:

A. F., aged twenty-one years, colored, a servant woman, was illegitimately pregnant for the second time. She was admitted to the Maternity April 16th, and performed the portion of household work assigned to her in apparent good health. Examination of her urine revealed nothing indicating an abnormal condition. An examination of the genital tract gave evidence that the patient had at some time suffered from gonorrhœa, although no acute process was then present. She was delivered on May 13th, after a spontaneous labor of twelve hours. A laceration of the mucous membrane of the vagina occurred, which was thoroughly douched with a bichloride of mercury solution, 1:4000, and dusted with iodoform. Her child, a female, weighed six pounds and four ounces, and was in good condition. The placenta was remarkable for the abundance of calcareous material contained in it. Nothing abnormal occurred in the condition of the patient until the seventh day after delivery, when she had a chill, and her temperature rose to 105.2° F. An examination of her urine soon after delivery revealed the presence of pus. The bladder was accordingly douched with creolin mixture, and the patient was given salol internally. Soon after the occurrence of the chill the uterus was curetted with a douche curette, but no evidence

of a septic process in the uterus or vagina was obtained. The uterus was not tender but was slightly enlarged, the abdomen was not swollen, and there was no evidence of pelvic inflammation. The urinary tract, however, seemed the seat of bacterial invasion. The urine remained acid in reaction, and pus continued to be present. The percentage of urea still remained nearly normal, traces of sugar were found, and a considerable quantity of albumin.

The report on urine examination is as follows:

Chemical.

Date.	Color.	Reaction.	Specific gravity.	Chlorides.	Serum albumin.	Sugar.	Urea.
May 4	Yellow.	Acid.	1025	Present.	2 gms. to litre.	None.	1.9 per ct.
" 12	"	"	1022	"	2 gms.	"	1.7 "
" 22	Reddish-yellow.	Faintly.	1018	"	2 "	"	1.8 "
" 26	Red.	"	Not taken	"	5 "	"	1.3 "
" 29	"	"	1012	"	5 "	Trace lactose?	1.5 "
June 3	Reddish-yellow.	"	1010	"	3 "	None.	1.7 "
" 5	Reddish-yellow.	"	1010	"	2 "	Trace lactose?	1.8 "
" 8	"	"	1012	"	4 "	None.	1.6 "

Microscopical.

On all examinations large numbers of pus cells could be seen. Granular, hyaline, and a few blood-casts were present in varying numbers. Epithelium from the bladder, with a few cells from the kidney, could always be seen.

The patient died of exhaustion on the twenty-seventh day after the birth of her child. At no time could an enlarged kidney be felt by palpation, nor was there evidence of abscess in the pelvis, abdomen, or kidney. Post-mortem examination showed that the uterus, tubes, and ovaries were normal. Both kidneys were much enlarged; capsules adherent; the ureters and bladder were thickened, and gave evidence of a chronic inflammation. Microscopic examination of the kidney revealed an acute parenchymatous nephritis.

As regards the possibilities of acute infection in this case by physicians or nurses, it can only be said that the same antiseptic precautions were scrupulously observed regarding her that are observed in all cases, and that at the time of her illness there was no other case in the Maternity presenting the same or similar complications. Careful study of the patient and the circumstances of her illness have led us to believe that germs, originating in a previous gonorrhœa and finding lodgment in the urethra or bladder, after labor invaded the ureters and kidneys, causing the nephritis which produced death. The patient's symptoms were distinctly those of intoxication with ptomaines. She yielded not at all to treatment, but grew progressively weaker, never rallying from the poison which ended her life.

The following cases of toxæmia, with threatened eclampsia, were terminated by treatment appropriate for the condition, and by the prompt induction of labor.

A. P., aged thirty-three, white, was pregnant eight months. She had borne several children, and on a former occasion said that she had suffered from "kidney trouble." She was pale and anæmic in appearance, and complained of headache, disordered vision, and swelling of the feet and ankles. Examination of her urine showed a very considerable amount of albumin, diminution in the excretion of urea, while the urine contained a large number of red blood-disks, with epithelium from the tubules of the kidney, and granular casts. After free purgation and a hot bath, labor was induced, resulting in the speedy delivery of a living child. The patient's symptoms were soon relieved, and she made a slow but satisfactory convalescence. In her case the exact condition was determined more by the use of the microscope than by any one agency, although thorough study of all the points in the case was necessary to comprehend its scope.

A second case of toxæmia treated by the induction of labor occurred in a woman the victim of chronic alcoholism, who entered the Maternity in a partially intoxicated condition, and was thought by the police to be in labor. It was observed in her case that excretion was deficient, that the percentage of urea was less than normal, and that she manifested the nervous phenomena to which attention has been drawn in the foregoing cases. Labor was accordingly induced; it was complicated by a false position of the head, which lodged with the parietal bone against the brim of the pelvis. It was necessary to give the patient chloroform, and to perform podalic version. She and her child made a good recovery.

The fact that the toxæmia of pregnancy results in a condition of marked anæmia after the puerperal period is illustrated by the case of a patient who suffered from persistently defective excretion during her pregnancy and after labor. Her child perished from pulmonary catarrh, and she herself was transferred to the medical wards of a hospital, where her condition of anæmia and kidney failure could receive more extended treatment.

It is quite possible for a condition of marked toxæmia to be present in which the examination of the urine fails to reveal either casts, albumin or marked deficiency in urea.

A primigravida, the wife of a physician, and a woman of more than ordinary intelligence regarding physiology and medicine, gave her husband great anxiety by reason of attacks of epigastric pain which might be described as gastric crises. This pain occurred at irregular intervals, was often worse at night, preventing sleep, and was unattended by nausea or vomiting. The patient's bowels moved daily, her legs were not swollen, the amount of urine secreted daily had gradually diminished, but so gradually that the patient's attention was not drawn to it until she was requested to give information regarding this point. The results of two examinations of the urine are as follows:

October 11, 1893. Color, yellowish red; sp. gr., 1026; reaction, acid; chlorides, normal; albumin, a trace; sugar, none; urea, 1.4 per cent.

Microscope. A considerable shedding of epithelium from bladder, though a few cells from the ureters can be seen. Cells are pale, and many are somewhat degenerated as to form. Uric acid, in various forms, abundant. A form somewhat resembling an old granular cast much broken down. A few crystals of oxalates.

17th. Color, yellow; specific gravity, 1014; reaction, acid; chlorides, normal; sugar, none; albumin, none; urea, 1.1 per cent.

Microscope. A large number of crystals of ammonia urate and uric acid in various forms. No casts of any kind, and very few epithelial cells.

Pronounced nervous symptoms were present, consisting of coronal and frontal headache, extreme restlessness, and melancholia greatly exceeding the usual timidity manifested by patients in her condition. The skin was slightly dry, the tongue clean, the appetite poor, while meat was a favorite article of diet. Her epigastric pain and nervous symptoms became so pronounced that her husband requested me to see the patient. A careful examination revealed the facts already narrated, and led to a diagnosis of toxæmia. The examination of the urine revealed no marked abnormality, except deficiency in quantity. The patient was at once given two and a half grains of calomel, with ten grains of soda at night, and the next morning the compound colocynth pill of the Pharmacopœia. Her diet was restricted as closely as possible to milk, and she was given a warm or hot bath every evening before retiring. Woollen underclothing was worn. In less than forty-eight hours from the time when the patient was first seen a marked improvement had occurred. The amount of urine had increased, the bowels had moved freely, the epigastric pain was less, the patient's mental and nervous condition was much better, and her appetite was not satisfied with the milk diet enjoined. She was urged to be as much as possible in the open air, and her diet was enlarged to include fish, oysters, milk, bread, and fruit. The warm bath was continued at evening, and a colocynth pill and an occasional dose of calomel were employed, as her husband found necessary. A week from the day of my first examination her symptoms had entirely disappeared. This patient's mother perished from eclampsia at her birth. That this case could easily have gone on to eclampsia we believe from the very unstable condition in which we found her nervous system and her diminished excretion. She was shortly afterward delivered of a fine male child after a normal labor.

The treatment of the toxæmia of pregnancy must be instituted with reference to promoting the action of five excretory organs—namely, the kidney, liver, intestine, skin, and lungs. The usual precaution of limiting the patient's diet largely to milk is of course indicated, but when nutrition suffers from the monotony and distastefulness of milk, there should be no hesitation in giving a more liberal diet to preserve the patient's strength. Fish and oysters, the white meat of fowls, fruits in abundance, and the more digestible sorts of bread, fresh and nutritious, form a usually acceptable diet. Pure water must be taken, but not in excess, as it is possible to seriously embarrass the kidneys by a sudden increase in the amount of fluid taken. Tea had better be omitted, while the diuretic effect of coffee is sometimes of value.

The literature of the subject affords abundant evidence that the liver has an important part in the production of this condition. However theory may dictate regarding treatment, I have no doubt of the practical advantages following the occasional use of calomel and soda to promote the action of the liver and kidneys as well. This should be followed by a purgative producing free and liquid stools. Salts of potassium should be avoided because of the irritant properties possessed by potassium when introduced into the fluids of the body. Colocynth is a convenient and efficient drug for this purpose. The bath and pack are the only efficient remedies which experience suggests in promoting the excretory action of the skin. Where the hot bath is depressing, the warm bath, accompanied by the ingestion of a small quantity of hot water, is of decided value. This may well be taken just before retiring, thus avoiding the danger of exposure to cold following the bath. Light woollen should be worn next the skin in summer or winter. In addition to the bath, in severe cases the pack in sheets wrung out of hot water, or the hot-air bath, is of the utmost value. Further, where a condition of moderate toxæmia exists, or continues a long time, yielding to treatment with difficulty, great benefit will be found from gentle massage; this should include the limbs and back, avoiding the abdomen. It may well be given at night, followed by the bath, and often secures for the patient a refreshing sleep.

The importance of fresh air in abundance for these cases is sometimes overlooked; in summer, conditions for obtaining good air are very commonly present; but in winter it is necessary to attend to this point.

Especial attention is called to the diagnosis of toxæmia from the general condition of the patient's nervous system; a careful and experienced observer can detect a very different condition in the toxæmic patient from the simple nervousness and apprehension of the pregnant woman; the condition is that of intoxication varying in degree; thus we recall the case of a woman admitted to a hospital and soon after taken with severe eclampsia; after a dangerous illness of several days she recovered, having been utterly oblivious of her coming to the hospital, and of her illness, until she was virtually convalescent. She had been as completely intoxicated as if drugged with alcohol or opium. An interesting manifestation of this condition is afforded by the peculiar mania often seen in eclamptic cases; thus in the case of S. H., already described, for several days before death her delirium was a very pitiable form of mania.

The clinical picture afforded by the toxæmic condition must impress itself upon the careful observer as one of an intoxication showing itself by a disordered nervous system. We regard as cardinal symptoms of this condition the nervous phenomena already described, and diminished excretion. Upon these a diagnosis is to be made and the treatment of

the case conducted. As regards the cardinal principles of treatment, we are opposed to the use of sedatives and narcotics; the patient's need is for elimination, and that must be secured as promptly as possible. The sedative effect of eliminative treatment is often remarkable; thus in the case of the physician's wife already described, she asserted that the most enjoyable features, physically, of her life during the last weeks of her pregnancy were the warm bath taken at evening and the few hours of refreshing sleep which followed. She also recognized the distinct benefit obtained by free purgation.

In the face of threatened eclampsia, our duty lies in prompt emptying of the uterus. Here an anæsthetic is often requisite at the time of labor, and my preference is for chloroform. The danger of delay in emptying the uterus is too familiar to require mention, and when the patient's symptoms are not relieved by thorough elimination from the intestines, skin, kidneys, liver, and lungs, the time for delay is certainly past, and we shall not be faithful to our duty if we allow a patient to go further in this dangerous condition. The recent literature of eclampsia contains striking evidence of the value of terminating the pregnancy by dilating the uterus and removing the foetus. If this be done under anæsthesia and with antiseptic precautions, the results are sufficiently good to command a careful attention for this method of treatment. In my experience, it is a mistake to employ drugs which tend to depress the patient and favor the occurrence of œdema; such is pilocarpine. When stimulation is needed, I have seen benefit from alcohol, digitalis, and in cases of eclampsia when labor had terminated and exhaustion threatened, in the hypodermatic use of strychnia.

A CONTRIBUTION TO OUR KNOWLEDGE OF EPIDEMIC CEREBRO-SPINAL MENINGITIS.¹

By SIMON FLEXNER, M.D.,

ASSOCIATE IN PATHOLOGY,

AND

LEWELLYS F. BARKER, M.B.,

FELLOW IN PATHOLOGY, JOHNS HOPKINS UNIVERSITY, BALTIMORE.

(From the Pathological Laboratory of the Johns Hopkins University and Hospital.)

EPIDEMIOLOGY, ETIOLOGY, AND PATHOLOGY.

THE epidemic of cerebro spinal meningitis to be reported here was one of the most extensive which has prevailed either in this country or abroad for many years. The outbreak, which began in January, had by the first of February become so alarming as to lead the State Board

¹ A report on the epidemic disease which prevailed during the winter and spring of 1893 at Lonaconing, Maryland, and at other places in the George's Creek valley.

of Health to decide on making an official investigation for the purpose of determining the cause, and, if possible, of adopting some means to prevent the further spread of the disease.

The fact that one of us (Dr. Flexner) was officially delegated to make this investigation made it easy for us to gain access to a large number of cases, and we wish to acknowledge gratefully the many kindnesses, direct and indirect, received at the hands of Dr. C. W. Chancellor, Secretary of the State Board; Drs. J. D. and W. Q. Skilling, Drs. M. G. and A. S. Porter, Dr. J. O. Bullock, of Lonaconing, and Dr. A. W. Smith, of Ocean. Without the co-operation of these gentlemen these researches would have been impossible; as it was, every opportunity was given us for a full and complete study of all individuals affected during our visit to the diseased region.

The town of Lonaconing is a mining centre in the Alleghany mountains and contains some 5000 inhabitants. The location is peculiar and is more or less of interest from an epidemiological standpoint. The town is situated in a narrow valley and extends well up the sides of the steep hills which enclose it. Through the bottom of the gulch runs a muddy stream known as George's Creek. The mountains rise more or less abruptly from the edges of the creek, and the town may, for our purpose, be divided into two parts: first, that lying in the valley in which are situated the business portion and for the most part the dwellings of the professional and business men of the place, and second, that built on the mountain sides, consisting almost entirely of miners' dwellings. The stream and valley are somewhat tortuous at this spot, and give the place the appearance of being surrounded on all sides by mountains.

One is struck almost at once by the arrangement of the houses on the incline. They are placed in long rows, tier above tier, facing the valley; behind, and therefore above the houses, are situated the privies, placed flat upon the ground; and not infrequently the cow-stable is located quite close to the dwelling. Before our arrival at Lonaconing there had been a heavy snowfall, but the weather soon afterward became mild, the snow melted, and exposed to view and made doubly striking by contrast the dreadful conditions which existed. The water streamed down the mountain sides, carrying with it the general refuse from the yards, the material from the cow-stables, and the excreta from the outhouses of the upper tiers, through the yards, past the dwellings situated below, and finally entered the creek, which acts as a huge sewer winding through the centre of the town. On their way these polluted surface-washings found no system of drains for their reception, and in places crossed the common roadway in little rivulets, through which the inhabitants of the town had to drive and walk.

The water supply of Lonaconing is derived partly from surface wells and partly from cisterns, and we actually observed during a thaw the entrance of surface water and the accompanying filth directly into wells which were in daily use for drinking and culinary purposes. Significant, too, is the fact that in the valley the wells are situated often only a few feet from the creek, and it is certainly not hard to believe that the contaminated water from the creek could penetrate through the soil and become mixed with the water of the wells. The slaughter-houses are in the heart of the town upon the banks of the creek, and the blood and waste material from these find their way into its waters.

These unsanitary conditions are not confined to Lonaconing alone, but in its course George's Creek passes through a number of small towns, each of which adds its quota to the general filth, and only a short time ago an investigating party inspecting the river between Westernport and the Phoenix mines found among other things carcasses of horses in the stream or lying along the banks.

The population of Lonaconing is chiefly made up of coal-miners and their families. In many instances there was distinct evidence of overcrowding, as many as eight and ten individuals living, eating and sleeping in a house of four small rooms. In one house in which a fatal case occurred eleven persons slept in three bed-rooms. The individual houses in the long rows on the hillside are built so close to one another that often there is scarcely room for a footpath between them. There were, however, among them many well-built and commodious houses, though, as we shall show later, the occupants of these were by no means immune from the disease.

From what we have said it will be obvious that, whether or not cerebro-spinal meningitis is a filth disease, Lonaconing and the other towns situated along the banks of George's Creek are, and have been for years, in about as unsanitary a condition as could be well imagined, and it would be little wonder if typhoid fever, diphtheria, dysentery, and the whole group of filth diseases should find in them an endemic home. And during the past spring, besides meningitis, the medical men of Lonaconing have had under their care many cases of scarlet fever, measles, parotitis (an epidemic of over 100 cases), influenza, pneumonia, diphtheria, and acute articular rheumatism.

By far the greater number of the cases of meningitis occurred in the higher portions of the town, and they were usually found confined to little foci or groups of houses, points which have been noted by different observers also in other epidemics. To this rule, however, there were numerous exceptions. A few of the patients lived close upon the margin of the creek, and isolated cases were by no means rare. One boy, who died on the ninth day of the disease, lived on Jackson Hill, fully a

quarter of a mile from any other habitation, and of the patients at Ocean none lived more than thirty feet above the level of the stream.

The earliest cases of which we have notes occurred during the first week in January, 1893. During the course of a dance two young men who had overheated themselves imprudently rushed into the open air to get cool. The weather outside was extremely cold, and it is said that their hair, wet with perspiration, was frozen upon their heads. The drive to their homes afterward was long and very cold, and these two men, aged twenty and twenty-two respectively, developed symptoms of cerebro spinal meningitis next day. Immediately afterward the disease became epidemic, appearing in many different places in Ocean, Midland and Lonaconing about the same time. After every marked fall of temperature there were fresh cases to record, and the disease prevailed there in varying intensity up to the middle of May. Up to March 1st there had been sixty-eight well-marked cases, besides some forty which were classed as abortive cases, making a total of over one hundred cases. Since our return there have been many more cases in Lonaconing, as well as an alarming outbreak in Frostburg, making the total number of cases about 200.

Of the sixty-eight patients in whom the symptoms were clearly defined thirty-seven were males and thirty-one females. In other epidemics the number of females attacked had, as a rule, slightly exceeded that of the males, and it would seem probable, therefore, that sex bears little or no relation to the etiology of the disease. Undoubtedly, children and young adults were most susceptible, although the occurrence of the disease among older people cannot be denied, one of our cases being a man of thirty-eight years, another a woman of forty. The youngest patient observed was a child of five months.

The study of different epidemics of cerebro-spinal meningitis has not as yet led to the detection of a common factor or set of conditions in the localities attacked. The disease shows no special predilection, so far as one can judge, for particular regions, or for any season of the year, and no one class of people is affected, the apparently robust and the weak suffering alike. It has, indeed, been established that, *cæteris paribus*, young individuals are more susceptible than adults, and although there is no sharp line to be drawn in the occurrence of the disease under different circumstances, yet its greater frequency under unfavorable hygienic surroundings, such for example as in barracks and in country districts, is to be borne in mind. Epidemics have occurred in the same district, affecting areas slightly removed from one another. Such an epidemic, studied by Low, appeared in 1890 in certain of the eastern counties of England. The parishes affected all lay within short distances of one another in agricultural communities, in all of which it was the custom to use the house-refuse for fertilizing purposes. The drinking-water was obtained

from wells and from open pits, though the water from the latter is said to have been boiled before being used. In other epidemics, after a considerable period of quiescence, the disease has reappeared in the same locality, examples of which are given by Wolff, who studied the Hamburg epidemic.

Osler states that epidemics have occurred more frequently in winter and spring, and that villages and country places have in certain of these suffered relatively more than cities. The Leipzig epidemic which Strümpell studied appeared there in 1879, continued into 1880 and 1881, beginning in the winter and becoming more severe in April and June, almost ceasing in February and March of 1881, only to appear again in a sporadic form later. Claverie described an epidemic at Rochefort which prevailed during the winter of 1885-86 in which there were marked oscillations of temperature, although at no time did the thermometer fall below zero. Lemoine observed in the epidemic at Orleans during the winter of 1886 that a sudden lowering of the temperature was followed in one or two days by a marked increase in the number of cases.

The epidemic at Lonaconing appeared in the winter and reached its maximum during the coldest weather. The winter was, moreover, one remarkable for its severity, and there were heavy falls of snow, with very cold weather alternating with thaws of short duration. During the month of February, however, when the cases were perhaps most numerous, the weather, as shown by the observations reported from Cumberland, Md., to the U. S. Weather Bureau, was exceptional only for the rainfall, for while the average rainfall for the month of February during the past twenty-two years has been 2.51 inches, this year the rain and melted snow amounted to 3.58 inches, the snowfall itself measuring twenty inches. During the month there were eight clear days, two cloudy, ten fair, and eight of rain and snow. The highest temperature during February, 1893, was 58° F., the lowest 3° F.; mean 33° F. The averages for the last twenty-two years are: Highest temperatures 58°, lowest 2°; mean temperatures, 33°. It may be mentioned that this epidemic agrees with that described by Low in that the disease occurred in several of the neighboring places in the same valley.

The epidemic and sporadic cases of cerebro-spinal meningitis which have occurred since 1886 are of especial interest inasmuch as they have been studied bacteriologically. This method of study has been rewarded by the isolation of a particular micro-organism from the exudate in the meninges, namely, the micrococcus lanceolatus, which there is now reason to believe bears an etiological relation to the disease.

Weichselbaum found this organism in the exudate in the meninges in 1886, and Netter obtained it from cases in the epidemic studied by Lemoine in the same year. Goldschmidt isolated it from a case in 1887,

Ortmann in 1888, and Foà and Bordoni-Uffreduzzi in cases in an epidemic occurring in Turin in 1888. Banti found it in 1889, and Bonome obtained it at autopsies during a small epidemic in Padua, which occurred in 1890. Mirto obtained the micrococcus lanceolatus in 1891 from the exudate in a case of epidemic cerebro-spinal meningitis—a man twenty-two years of age. The cocci were in every way typical, and when inoculated into rabbits gave rise to fatal septicæmia. Klippel found it in sporadic cases in 1891 and Ribbert in 1892. Ribbert's cases were those of two brothers who were affected almost simultaneously, one of them dying in forty-three, the other in forty-seven hours.

The first to isolate the micrococcus lanceolatus from the exudate in meningitis was Eberth, in 1880. The meningitis in this case was secondary to pneumonia. Since this time many others have studied this form of meningitis and have obtained the same organism. Thus Bozzolo and Leyden in 1883, Weichselbaum and Fraenkel in 1886, and Meyer and Netter in 1887; Hansen and Bonome in 1888, Monti in 1889, and Gabbi and Puritz in 1890. In Professor Welch's laboratory in Baltimore, in three cases recently the same organism was isolated.

There is another class of cases in which a meningitis develops in the course of diseases other than pneumonia, or follows upon injuries. In some of these the micrococcus lanceolatus has been found, in others different bacteria. For example, Netter found in 1889 the Friedländer bacillus in a case of meningitis following otitis media. Mills claims to have isolated the Friedländer bacillus also from a case of pneumonia associated with meningitis, but it is not improbable that his organism was the Fraenkel-Weichselbaum diplococcus. Monti, in the same year, found the micrococcus lanceolatus in a case of combined arthritis and pleuritis. Kainen, in 1890, separated a bacillus which he regarded as identical with the typhoid bacillus; and in the previous year Adenot had likewise isolated an organism which he thought to be the typhoid bacillus. Debove about this time described a case of combined peritonitis and meningitis due to the pneumococcus. Hanot and Luzet, in 1890, isolated streptococci from the exudate in the meninges in a puerperal woman who had died of meningitis and general infection. Le Gendre and Beausse, in 1892, obtained from a case of meningitis associated with otitis media, arthritis, and broncho-pneumonia, the staphylococcus pyogenes aureus. Klippel, in 1892, found, in a demented individual who died of acute meningitis, the micrococcus lanceolatus. There was an old area of softening present, and over this the exudate was most marked. Boulay and Courtois-Suffit, in 1890, isolated the micrococcus lanceolatus from a case of combined peritonitis and meningitis without pneumonia, and Bonome has observed a case of combined pleuritis, pericarditis and meningitis due to the pneumococcus. Zorkendorfer, writing from Chiari's laboratory, reports a very interesting case observed

during this year in which at autopsy, besides a purulent meningitis, there was a well-marked inflammation in the ethmoid cavity and suppuration in the sphenoidal sinuses. Besides, the mucous membrane of the pharynx was reddened and covered with a thin layer of pus. From the pus in the meninges, as well as that in the sphenoidal sinuses, he found diplococci in cover-slips. He succeeded in isolating them also in pure culture, and found, by injection into the peritoneal cavity of rabbits, that they set up a fatal septicæmia, the organisms in the blood at autopsy corresponding in every respect to the *micrococcus lanceolatus*. In three cases of purulent meningitis examined by Neumann and Schaeffer, once the pneumococcus, once the staphylococcus pyogenes aureus, and in the remaining instance a fine bacillus was found. In a fourth case the results of the examination were negative. Netter has also in one case found the staphylococcus pyogenes aureus. Roux states that he isolated from a case the staphylococcus aureus and albus and a bacillus resembling that of typhoid fever. Mircoli claims to have obtained from one case a staphylococcus resembling the aureus and a bacillus which he identified as the bacillus pyogenes foetidus, the latter being obtained in cultures from the motor cortex and medulla.

Früs describes an epidemic at Copenhagen in which 185 persons (111 under fifteen years of age) were affected. From the pus of nine cases examined by Roosing a thick, short bacillus was obtained which is described as approaching a coccus in form, and is stated to grow characteristically on gelatin. We recently made an autopsy on a young man who died of meningitis, following an injury to the head. There was contusion of the scalp but no loss of continuity in the bones of the skull. In the exudate of the meninges the *micrococcus lanceolatus* was found; no other focus of suppuration was present in the body. Prudden, in a case of traumatic meningitis occurring in a child of thirteen months (a patient of Holt's) has isolated the *micrococcus lanceolatus* from the exudate. White mice inoculated with the organism died in thirty-six hours from septicæmia.

The number of bacteriological examinations of uncomplicated cases of meningitis, occurring either sporadically or in epidemic form, is up to the present time not large. There is, however, such uniformity in the results obtained that while it is perhaps not to be considered as established for all, yet the majority of cases appear to be caused by an organism which, in its morphological characters and biological properties, is not to be distinguished from the *micrococcus lanceolatus*.

During our stay at Lonaconing two deaths occurred, and we were permitted to make autopsies. The first was a child of nine years, who died on the third day of the disease. The autopsy showed an extensive convexity-meningitis with spinal meningitis. The second autopsy was on a girl of sixteen who died in the third week of the disease. In this case

there was an extensive exudate over the base with effusion into the posterior fossa.

PATHOLOGICAL ANATOMY.—The changes in the central nervous system in cerebro-spinal meningitis have been studied, among others, by Strümpell, v. Campe, and Hagelstam. They are not always of the same kind or extent, and depend in part, at least, upon the duration of the disease. In the explosive cases the evidence of more than hyperemia and serous exudation can often not be appreciated by the naked eye; but the microscopical examination of such cases shows that a tolerably rich emigration of leucocytes into the pia-arachnoid has already taken place. In the cases in which death has been longer delayed the inflammatory alterations are often pronounced, and they are not necessarily limited to the lepto-meninges. The substance of the brain and cord, as shown by Strümpell, are commonly involved, and the legitimacy of the terms meningo-encephalitis and meningo-myelitis has been suggested by him. While the inflammatory processes in the substance of the brain and cord are generally to be made out only with the microscope, yet in some instances, as pointed out by Zenker and Klebs, and more recently by Strümpell, abscesses of comparatively large size may exist.

In the substance of the central nervous system the invasion may take place in three ways: (1) by direct extension from the meninges; (2) along the vessels entering from them; and (3) through the development of independent foci. These several modes were observed by Strümpell, whose observations were confirmed in our cases. Hemorrhages, especially into the substance of the cord and into the central canal, have also been observed.

The exudate in the meninges consists of pus cells, red blood-corpuscles, fibrin, and serum in varying proportions. The amount of serum may be considerable, as in the case reported by Stillé, in which three pints were present, death having taken place on the thirty-fifth day of the disease. The exudate fills the meshes of the pia-arachnoid, dips down between the convolutions, enters the ventricles of the brain and the central canal of the cord, and appears in the form of a cellular infiltration in the substance of the brain and cord. Finally, the extension of the process along their course gives rise to the symptoms referable to the involvement of the nerves.

The alterations found in other organs of the body cannot be said to be peculiar to this disease, but are such as attend infectious diseases in general. Among these may be classed the hemorrhages into the serous membranes and into the substance of certain organs; the swelling, increased granulation, and even fatty degeneration of the cells of parenchymatous organs, and the hyperemia and degeneration of the voluntary muscles.

In our two autopsies the acute and subacute, as well as the convexity and basal forms of the disease, were represented. The first was the girl of nine, dying on the third day of the disease. Autopsy two hours after death. There were no adhesions between the dura and the skull-cap; the outer surface of the dura was smooth, the longitudinal sinus containing dark fluid blood; the dura and pia-arachnoid were not adherent; the vessels of the pia were greatly dilated and filled with blood of a dark color. The soft meninges were swollen, but no considerable quantity of fluid escaped from them; they were opaque, especially over the convexity of the brain, and in the depressions between the sulci heavy opaque white streaks and bands were visible. This exudation into the meninges was confined to the convex surface of the brain, the base being free from it, but the ventricles were somewhat dilated, and contained an excessive amount of clear serum.

The dura covering the spinal cord, especially in its inferior part, was wide and bulging. On incising it near the middle of the lumbar region about 40 c.c. of slightly turbid fluid escaped. The spinal dura was not adherent to the pia. In the meshes of the latter was an exudate which was not uniformly distributed, but was most abundant posteriorly and corresponded for the most part with the lower cervical and dorso-lumbar regions. This exudate was white and opaque and resembled that present in the brain. The vessels of the pia of the cord were likewise injected, their contents being dark in color. On section of the cord the substance presented a vivid pinkish tint.

There were subserous hemorrhages into the pleura and pericardium, and beneath the capsule of the kidney there were punctiform hemorrhages. The cut surface of the kidneys and liver presented an opaque appearance. There was no pneumonia and the nasal sinuses were free from perceptible inflammation. The spleen was only slightly enlarged, the color was darker than normal, its substance somewhat softened, and the Malpighian bodies were swollen and strikingly distinct. The mucous membrane, especially of the small intestine, was congested, and the follicles were swollen.

The voluntary muscles were intensely red, and this was especially noticeable in those along the spine, and a large amount of blood escaped from them on incision.

The bacteriological examination of the pus in cover-slips from the exudate in the meninges of the brain and cord showed the presence there of the micrococcus lanceolatus without admixture with any other organism. The micrococci occupied pus cells and were also present in the fluid among the cells. They were fairly numerous.

Cultures were made in plain agar-agar, in glycerin-agar, and in Guarnieri's medium (Prof. Welch's modification). Owing to circumstances they could not be brought into a thermostat for forty-eight hours. Tissues were placed immediately after the autopsy in various hardening agents, Flemming's solution, bichloride of mercury, and absolute alcohol. Inoculation of animals with the exudate could not be practised at Lonaconing. The tissues were sent to the laboratory in Baltimore by express, where inoculations of mice and rabbits were made.

We had been at Lonaconing several days before a death occurred. Before our visit there had been deaths almost every day, but the mortality diminished for a while, and during those days no new cases

developed. The death of the child of nine years took place at seven o'clock on the last evening we spent at Lonaconing, and the autopsy was made at nine. Cultures from the exudate were made at once on exposing it by drawing back the dura. Additional cultures were made an hour or more later. The first cultures were made at the moment the exudate was exposed, without disinfecting the surface, by inserting the needle under the raised dura; the second set, which included cultures from all the organs, was made in the usual manner after burning the surface of the organs. It is necessary to state that the second set of cultures was made in a carriage-house next a stable in which horses were kept.

On the afternoon of the day following the autopsy we left for Baltimore carrying with us fresh tissues for inoculating animals, the culture tubes, and the preserved tissues. We had proceeded as far as Cumberland, Md., when we received a telegram asking us to return to Lonaconing, as another death had occurred. The organs of the first case were, therefore, despatched by express to Baltimore, so that no unnecessary delay should occur before the inoculation of animals could be made. They reached Baltimore about noon on the following day, some forty hours after the autopsy. The animals inoculated (mice and rabbits) all recovered. The cultures were not sent at this time, but as a precaution were kept and carried by us to Baltimore, and placed in the thermostat just fifty hours after the autopsy.

The first cultures made *at the time of the autopsy* showed a very feeble growth of diplococci, but on transplantation no further growth could be obtained. All other tubes from the brain or cord showed either no growth or an abundant one of a tolerably coarse bacillus. This bacillus is probably to be regarded as a contamination, which is believed to have gotten into the tubes at the time of the inoculation. This would not be surprising considering the disadvantageous circumstances—above noted—under which the cultures had to be made. Culture-tubes from the organs remained sterile with the exception of those from the spleen. From this a growth was obtained of pure streptococci, which formed tolerably long chains, and were devoid of pathogenic effects when introduced in large quantities into mice and rabbits.

The cultures from the second case could not be made until Baltimore was reached. The autopsy was made at 10 A.M. (twelve hours after death), and the cultures at midnight of the same day. The tubes inoculated from brain, cord, and viscera remained sterile. Plain agar, glycerin-agar, and Guarnieri were the media used. Mice and rabbits were inoculated from the exudate in the brain and cord. None succumbed.¹

¹ In view of these experiments, it may be questioned whether the organism found by us in the exudates was really the *micrococcus lanceolatus*. It is, however characteristic of the

The histological examination of the tissues from the first case showed that an abundant exudation had taken place into the membranes of the brain and cord. It will be well, perhaps, to go more in detail into the microscopical characters of this exudate and of the lesions of the cord and brain. While the tissues were still warm they were placed, as has before been mentioned, in various hardening agents, including Fleming's solution, bichloride of mercury, and absolute alcohol.

For the study of the cellular elements in the exudate, the tissues fixed in bichloride of mercury and afterward hardened in alcohol, and those placed directly into absolute alcohol, gave the best results. The cord fixed with bichloride of mercury also showed well the alterations in the axis cylinders of the nerve roots, to be presently described. Sections from various levels were studied, and variations were noted; but they were hardly great enough to merit separate description. On the other hand, the pictures presented by the tissues prepared with HgCl_2 , as contrasted with those hardened in alcohol, merit separate consideration, and we are the more disposed to treat them separately on account of the general significance which may attach to the variations of cell appearance depending upon hardening and staining reagents.

The cord treated with HgCl_2 is well preserved, the morphological elements staining sharply. The *anterior half*: The membranes are swollen, the swelling being due to (1) the dilatation of the bloodvessels, and (2) an exudate in the meninges composed of serum and cells. The evidence of fluid is not to be made out everywhere with certainty, but areas occur in which the tissues are found pressed widely apart. The pia extending into the anterior fissure is swollen, and the bloodvessels are distended and filled with blood. This dilatation of the vessels is best seen at the anterior margin, where the fissure is widest, and again just before its termination at the white commissure, but it occurs elsewhere in the cord. The swelling of the tissues in the fissure is not due altogether to the increased accumulation of blood in the vessels and the transudation of fluid, but is in part dependent upon an increased number of cells in the tissue. These cells vary in size and possess nuclei which are of different sizes and forms. The majority of these cells have not the appearance of leucocytes with polyform nuclei—in fact but few cells having the form characteristic of these are to be seen. Moreover, in the dilated bloodvessels few polynuclear leucocytes are present. The cells which make up the increase in the tissue are chiefly small cells with round, deeply-staining nuclei and a small amount of protoplasm; the others are all of an epithelioid type. The latter are in small numbers only, and perhaps not to be regarded as essentially increased. Single red blood-corpuscles are free in the tissues and a small quantity of blood pigment is to be found deposited there. Finally, in the meshes of the membrane there are small globular masses

lanceolate diplococci to show a variable vitality and great variation in their pathogenic effects on animals, and from these well-established facts we are the more disposed to regard the bacteria we found as being identical with the lanceolate cocci which give rise to acute lobar pneumonia.

varying in size from one-third to one-half the diameter of a red blood-corpuse. In eosin these stain pale pink, while the red blood-corpuses take on a bright yellowish-red color. The globular masses are less refractive than the red blood-corpuses, which stain well; but they approach more nearly in staining and refraction shadows of red blood-corpuses, some of which are also occasionally seen. It is not unlikely that they represent partly disintegrated red corpuses, if indeed they are not globular masses of hæmoglobin. In the depth of the fissure the extravasation of blood is more decidedly marked than is the case near the surface.

Passing from the anterior fissure toward the anterior roots, at first a slight diminution of the cellular infiltration is noted, but at the roots the exudate is more abundant. In the angles between the roots and the cord dense accumulations of cells may be found. The forms which predominate here in the exudate are again the small round cells, although a larger proportion of cells with vesicular nuclei, some leucocytes with polymorphous nuclei, and a few red blood-corpuses are present. This mass of cells is on the surface, and it can be seen that a proliferation of the cells of the lymph spaces has taken place in the pia beneath; in these spaces an occasional "polynuclear" leucocyte is seen. There is an almost uniform layer of cells between the anterior lateral and the posterior lateral fissures. At the posterior roots the increase in the exudate is marked. The cells fill the tissues of the membranes, and about the veins of the pia there are occasional accumulations of round cells. The polynuclear leucocytes are relatively slightly increased in number in this portion of the cord, and are correspondingly more numerous in the bloodvessels. The predominating cells, however, resemble lymphocytes or the mononuclear cells of granulation-tissue. Toward the posterior median fissure the exudate becomes still thicker, the membranes are obscured, and more red blood corpuses are mixed with the exudate. In this situation there are cells equal in size to four or six of the round cells; they are thin and transparent, are round or polygonal in shape, have a feebly staining protoplasm and vesicular nuclei, and often contain other cells, especially leucocytes with polymorphous nuclei, within them.

The bloodvessels of the cord itself are dilated. This is the case both in the gray and in the white matter. Just beneath the pia hemorrhages have occurred, some of which extend into the substance of the cord, and in the anterior lateral columns small hemorrhages have taken place independently of those under the pia. There is no perceptible tendency of the process of the membranes in this instance to pass into the cord. Separate foci of leucocytic accumulation do, however, occur; but they are neither large nor numerous, nor, as far as could be determined did they have any connection with bloodvessels. The largest collection observed was in size a little smaller than a miliary tubercle (Fig. 1).

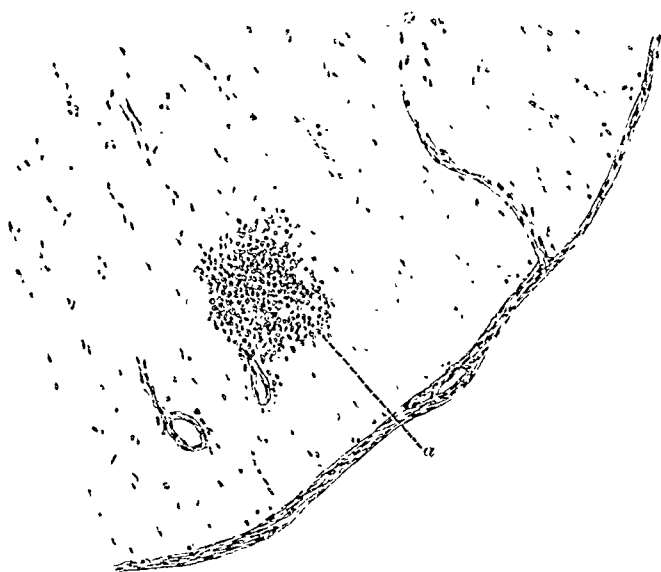
The ganglionic cells show certain differences among themselves, consisting of variations in the granulation of the protoplasm, the clearness of the nuclei and nucleoli (these being in some cells quite indistinct), but especially in the sharpness of the cell margins. In some, particularly in those in which the nuclei are indistinct, the margins of the cells are very indefinite. These are the only changes observed in

the large multipolar cells of the anterior horns. In the posterior horns an occasional cell may be seen in which the refraction of the protoplasm is increased, and these cells are swollen and the lymph spaces surrounding them obliterated.

The changes described by Strümpell and Hagelstam in the axis-cylinders of the cord were not observed by us in these specimens, probably for the reason that, although all other parts of the cord were well preserved and stained perfectly, the axis-cylinders did not stain satisfactorily. However, in the nerve roots these as well as interstitial changes were observed, and in some instances were quite marked.

Swelling of the axis-cylinders in the cord has been noticed in nephritis, tuberculous meningitis, and leukæmia by F. Schultze, by Kohler

FIG. 1.



Section of spinal cord showing collection of leucocytes in its entrance at *a*.

in the oculo-motorius in tuberculous meningitis, and Hoche found it both in the cord and nerve roots in tuberculous meningitis, and describes in addition a cellular proliferation of the peri- and endoneurium of the latter. The swelling of the axis-cylinders also occurs in variola, typhoid fever and septicæmia. (Hoche.)

The anterior roots show fewer alterations than the posterior. The bloodvessels in the perineurium are swollen and a few red blood-corpuscles are found free between the nerve bundles. There is no marked proliferation in the interstitial tissue. The majority of the nerve fibres are unaltered, but still not a few are swollen and stain in hæmatoxylin feebly, those which are unchanged staining more deeply. These swollen fibres have on an average a diameter more than twice that of the others.

The normal axis-cylinders lie in a space which has apparently been formed either by the disappearance in part, or the contraction, of the myelin sheath, a faint line of myelin being still visible just inside

Schwann's sheath; in some instances the myelin entirely fills the space between the axis-cylinder and the sheath of Schwann. On the other hand the swollen cylinders, which occur singly or in groups, always fill the space inside the myelin sheath, being distinguished from the latter by their larger size and by their staining properties. It is worthy of note that in those nerves in which a cellular proliferation, especially around the veins, can be made out, more axis-cylinders show this change than where the cellular increase is not so apparent.

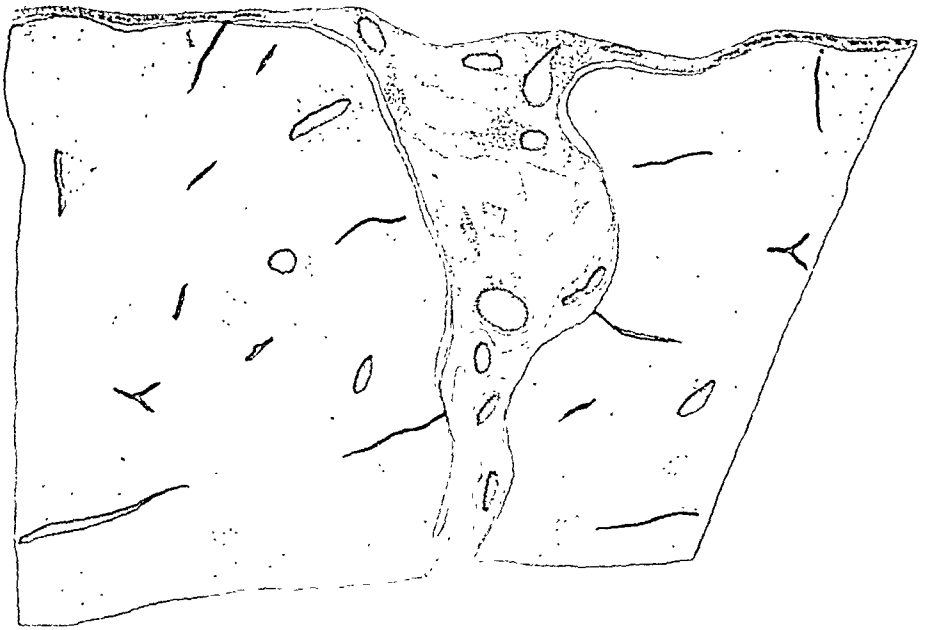
The posterior roots show the same changes as the anterior, only in a more pronounced manner. It is not uncommon in these to find as many as twenty or thirty swollen axis-cylinders lying close together. The interstitial tissues of the nerves and the epineurium are also affected. A considerable cellular collection occurs at times in these situations, and the increase in the peri- and endoneurium reaches so high a degree as to obscure the nerve fibres. This, however, seldom happens. The cells forming the collections are principally of the type of small round cells.

Specimens of the cord hardened in absolute alcohol were found well suited for the study of the cellular elements making up the exudate. Sections stained in aqueous solution of fuchsin or magenta show, as the important difference between them and those of the tissues hardened in solutions of bichloride of mercury, that more polynuclear leucocytes are present in the exudate than was before apparent. These cells are found on the anterior but in larger numbers on the posterior aspect of the cord, and in the cell masses in the latter, leucocytes presenting the most irregular nuclear forms are met with. Nuclear fragments are to be found in small quantity. Notwithstanding this difference, the cell-forms which are usually regarded as being derived from the fixed cells are still present in large numbers. In one section a small collection of polynuclear leucocytes, not associated with a bloodvessel, was found in the lateral horn. Again, in a section of one of the anterior roots a small collection of polynuclear leucocytes, and near by an evident proliferation of the nuclei of Schwann's sheath, was observed. Single polynuclear leucocytes are found between the nerve fibres, and in the bloodvessels there is an evident leucocytosis.

Specimens taken from various parts of the brain were hardened in the same way as the cord. The tissues from bichloride and absolute alcohol again gave very good preparations. Various staining reagents were employed—hæmatoxylin and eosin, fuchsin, magenta. For the study of the bacteria, the methods of Gram and Weigert were used, as well as solutions of methylene-blue and gentian-violet applied in the ordinary way.

The thickness of the exudate is not only less on the convexity than in the sulci, but it is not uniform over the convolutions themselves. In some places the exudate over the convolutions is two or three times as deep as in other places. But it is in the sulci (Fig. 2) that the greatest accumulations of cells have taken place. The characters of the exudate are not essentially different from those described in the cord, but the relative number of the different kinds of cells is not the same. There is dilatation of the bloodvessels of the pia, and an increase of leucocytes with polymorphous nuclei in these vessels is more common than in those of the cord. Hemorrhages are also found, amounting at times to considerable extravasations and at others to the escape of a few corpuscles

FIG. 2.

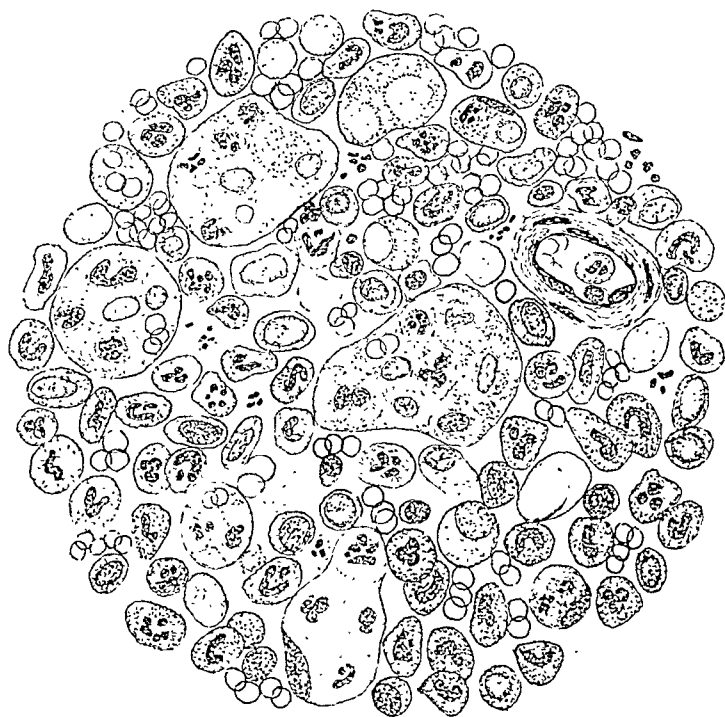


Section of the brain from Case I., showing dilatation of bloodvessels and the relative amount of exudation on the surface and in the sulcus.

only. A very little golden-yellow pigment is seen now and then. In the section the pia is lifted up from its connections with the underlying brain substance in many places, although the brain substance beneath is intact.

The cells composing the exudate consist of polynuclear leucocytes in considerable, perhaps predominating, numbers, but many other cells are also present. Among these latter are cells of the type of lymphoid cells, larger cells with vesicular nuclei, and, finally, cells much larger than either of these, which in certain situations are so numerous as to make up a considerable part of the exudate. These

FIG. 3.



From the exudate in the meninges in Case I. Polyform leucocytes, endothelioid cells, red blood-corpuscles, and the larger cells with inclusions. A few cells with fragmented nuclei, and free nuclear fragments, also present.

cells, as indicated, are not uniformly distributed. They may be found on the convexity, but are more common in the sulci. In size they equal several of the ordinary cells with vesicular nuclei, and they themselves possess nuclei of this type. They are either circular or polygonal in outline, thin and translucent, and what especially characterizes them is the fact that they often contain enclosed in their protoplasm other cells, principally polynuclear leucocytes. The number of cells which are included varies. Sometimes only two or three are seen, but as many as fifteen have been counted in one cell. Besides the leucocytes small round cells and red blood-corpuscles may be enclosed in these larger cells. (Fig. 3.) As stated, these large cells have vesicular nuclei and abundant protoplasm, and present the appearances of epithelioid cells.

While regarding them as proliferated endothelium derived from the pia, we can offer no explanation of the purpose which they serve in taking up other cells. The cells which they contain are practically normal; they possess nuclei which stain well and are of normal appearance. On the other hand, the large cells themselves are apparently normal. Sometimes it happens that the nucleus of one of the large cells is not sharply defined, or that the cell protoplasm stains in eosin a little more deeply than is usual with endothelium.

In the brain, besides inconsiderable hemorrhages, the cellular infiltration of the meninges has advanced to a slight extent into the substance along the vessels, and a few scattered leucocytes without vascular connection can be made out. In addition there is slight oedema, as indicated by the rarefied appearance of the cortex. Fibrin plays a very small part in the exudate, sections of the tissue hardened in alcohol stained by Weigert's method showing only a small amount.

Cover-slip preparations made at the time of the autopsy from the exudate in the brain and cord showed a fair number of diplococci, usually lancet-shaped and always surrounded by capsules, and, as previously stated, they were sometimes free and sometimes enclosed in cells. The results of our attempts to cultivate the organisms, as well as the inoculations of animals, have already been mentioned. In the tissues stained for bacteria by the methods of Gram and Weigert, as well as with gentian-violet and methylene-blue, typical diplococci were found. They were not particularly numerous, but were present there to the exclusion of other organisms, so far as could be determined by these staining methods.

The changes in the other organs may be summed up in a few words. In the *kidney* the bloodvessels generally are dilated, and small hemorrhages have occurred into the tubules. The tubes containing blood preserve their epithelium, but this is compressed. The epithelial cells of the convoluted tubes are swollen and granular, and here and there contain fine fat-droplets. An occasional epithelial cell devoid of a nucleus is seen. The *spleen* is congested and the lymphatic tissue of the nodules increased in amount.

The second case was that of a girl of sixteen who died in the third week of the disease. The autopsy was made twelve hours after death.

The dura was strongly adherent to the skull cap, and on removing it about 200 c.cm. of slightly turbid fluid containing white flakes escaped from the posterior fossa. The longitudinal sinus and the veins over the convex surface of the brain were distended with dark fluid blood, and the arteries were prominent. The fluid in the pia over the cortex, which was increased in amount, was turbid. On the base, covering the pons and the upper half of the medulla, was a firm white deposit which was intimately adherent to the underlying tissues. Over the base, from the pons to the optic chiasm inclusive, there was in the pia a fluid, milk-white in color, which was especially abundant in the anterior perforated space and over the optic commissure. The fourth ventricle and the lateral ventricles contained greenish-yellow gelatinous pus—indeed the former was completely filled with it. Both the lateral ventricles were dilated, and the choroid plexuses covered with an opaque exudate. A similar

opaque exudate extended along the sheath of the auditory nerve into the bony canal.

The pia-arachnoid, throughout the entire length of the cord on the posterior surface, contained a gelatinous exudate fully two millimetres in thickness, the exudate on the anterior surface being less marked.

The *kidneys* were swollen, cloudy, and cyanosed. The *liver* was cloudy and of very flabby consistence. The *spleen* was somewhat swollen, softened, and deep reddish-brown in color, the Malpighian bodies being very distinct. The mucous membrane of the *intestines* was swollen throughout, congested, and its lymphatic apparatus was hypertrophied. There was no pneumonia.

From the pus in the ventricles and from the exudate over the base of the brain, the micrococcus lanceolatus was obtained on cover-slips. The organisms were present in much smaller numbers than in the previous case. In the other organs no bacteria were found. The results of cultures and inoculation of animals from this individual have already been mentioned.

The tissues from this case were hardened in the same manner as those from the previous one, although they were not obtained in so fresh a condition. This fact is evident from the preservation, especially of the the cord. The exudate in the meninges stains well, while the substance of the cord does not stain satisfactorily. As in the previous case, the largest accumulation of cells on the anterior aspect of the cord is at the fissure, and the two points of greatest accumulation are on the surface and in the depth of the fissure. Laterally the exudate is not uniform, but is gathered into foci, and is more abundant where the anterior roots are given off. At this place the exudate passes along the roots as they leave the cord. The exudate becomes thicker still over the posterior aspect of the cord, but it is not uniform. The section has been carried through the dura, and where no mechanical separation has taken place the exudate is found to be in contact with this membrane. The thickness of the exudate over the posterior is several times that over the anterior aspect of the cord, and where the posterior roots come off the exudate surrounds them.

The cells which compose this exudate are again recognized as round cells, larger cells with vesicular nuclei (these varying in size, and often including other cells in their substance), and polynuclear leucocytes. There are fewer of the large cells present than in the sections of the brain from the acute case. The polynuclear leucocytes do not predominate in number over the other cells. In addition to the cells on the posterior aspect of the cord, where the exudate is thicker, it contains a material which stains very deeply in hæmatoxylin, and has an amorphous appearance. In this mass cell-forms can still be made out at times, but they do not stain. Nuclear fragments are also seen. This amorphous material may reach a considerable amount, and it is doubtless derived from the softening and disintegration of the exudate.

The pia is thickened in places by an actual new growth of connective tissue. This thickening is next to the cord, and is represented by foci of young and cellular connective tissue; in some of these there are already well-developed fibres with intercellular substance.

The nerve roots are not unaffected. Surrounding the veins are collections of round cells and the number of cells in the perineurium of the nerve

bundles and in the epineurium is much increased. This cellular proliferation is sometimes so extensive that it must have offered some interference to the functions of the nerve by the pressure exerted. The cellular proliferation in the nerve may actually obscure the nerve fibres. The fibres themselves show changes similar to those already described in the acute case. Following the vessels as they enter the cord, a cellular proliferation is often seen about them.

The meninges of the brain show in general the same condition as those of the cord. Sections made from various parts of the base covered with exudate show the latter to be composed of the same elements. Where the exudate is thickest the amorphous layer staining deeply in hæmatoxylin is also most pronounced. The pia is thickened by a new growth of tissue as well as by the exudate contained within its meshes. This new tissue is young, and where it occurs the pia is intimately adherent to the brain tissue. The vessels which pass in from the pia often show a proliferation of round cells in the perivascular lymph spaces, and such vessels may be followed for a considerable distance into the brain substance, the largest aggregations of these cells being seen in the neighborhood of the lateral ventricles. Here they reach a considerable size, are always associated with vessels, and are composed almost entirely of small round mononuclear cells, although a few polynuclear leucocytes may be seen among them. The lateral ventricles were, as previously stated, filled with pus. The epithelium of the ependyma is only in part preserved, and where it is deficient, cells with nuclei of a vesicular type forming a layer two or three cells thick are seen. In the pus adhering in the section to the ependyma, many fragmented nuclei exist. A single calcified area the size of a millet-seed was observed.

Sections of the brain and cord stained by Weigert's method showed fibrin to be absent. In sections the diplococci lanceolati were found, but only in small numbers.

The liver shows small collections of leucocytes (polynuclear) in the neighborhood of the portal spaces. The spleen is congested, and hemorrhages have taken place into the parenchyma. There is, in addition, a general hyperplasia of the lymphatic apparatus. A few "red blood-corpusele-carrying cells" are to be seen, and many of these contain blood pigment as well.

(To be concluded.)

REVIEWS.

THE PRINCIPLES AND PRACTICE OF SURGERY. By JOHN ASHHURST, JR., M.D., Barton Professor of Surgery and Clinical Surgery in the University of Pennsylvania; Surgeon to the Pennsylvania Hospital. New (sixth) edition, enlarged and thoroughly revised. In one octavo volume of 1161 pages, with 656 engravings and a colored plate. Philadelphia: Lea Brothers & Co., 1893.

WITHOUT question, Ashhurst's *Surgery* occupies a position among the foremost American Surgeries. It is terse and comprehensive; and when the more or less slipshod fashion in which medical text-books are often written is considered, one must admire the excellent literary ability displayed by the author. The book is compact (some Surgeries are as unwieldy as Webster's *Dictionary*), the presswork is faultless, and much judgment has been exercised in giving prominence to those points which most deserve it, without neglecting to mention everything else of value—the oldest ideas, the newest innovations. It is pleasant to see the extreme care with which credit is given to everyone to whom it is due, and the frequent processions of polysyllabic German, Russian, and French names attest thorough acquaintance with the literature of the subject.

The chapters on the eye and ear, which have been reviewed by Prof. George E. de Schweinitz and Prof. B. Alexander Randall respectively, present these specialties in their most modern aspects, and are as clear and full as limited space will permit; but it has always seemed to the reviewer somewhat unnecessary to cumber already sufficiently cumbersome Surgeries with subjects which are better considered in separate text-books at the disposal of every practitioner.

The statistics scattered through the volume are interesting and valuable, but they may become misleading if it is not borne in mind that they are often rather old. Hardly sufficient prominence is given to the fact that the modern principles of surgical cleanliness have materially altered many of the older statistical conclusions.

An excellent, and in the main successful, attempt has been made to bring the book up to the requirements of modern aseptic and antiseptic ideas; although the author states—contrary, certainly, to the experience of the majority—that while recognizing many advantages in the new methods, he has not found any marked diminution in mortality resulting from their use. Much stress is laid upon these questions in certain places, while in others there remains a somewhat inconsistent tendency toward older ideas and procedures. In the treatment of compound fractures, for instance, little if any stress is laid on the more recent methods, and the author speaks as though septic trouble were almost inevitable. No mention is made of antiseptic irrigation or immersion of the part in antiseptic fluids. We are not told that the surrounding skin

should be scrubbed and shaved, and otherwise rendered as far as possible aseptic; and the old bran-box treatment of Barton is recommended without reservation. Similarly, in compound injuries of joints, it is advised simply to hermetically seal the opening with gauze and collodion, or with lint dipped in the compound tincture of benzoin, and not a word is said about disinfection. Peculiarities of a like nature occur in other places—in the treatment of gunshot wounds, in the description of the operation of laparotomy, etc.

In presenting his method of preparation for an aseptic surgical operation, which is without doubt a good one, the author fails to mention the sterilization of the hands, which is surely of as much importance as many other things. He advises the mere submersion of instruments in a 5 per cent. solution of carbolic acid. With perfectly smooth and clean instruments this may suffice, but with the more or less rough ones in ordinary use, which are apt to contain dried septic material in their crevices, such immersion is not always effective, as has often been shown. Boiling or steaming is more reliable.

In face of what has recently been said and written, it is interesting to read that the author "cannot unite in the crusade against this most useful remedy (the poultice) in which some surgeons have engaged;" and that he countenances the closure of large, presumably aseptic, wounds with ordinary adhesive plaster.

Circumstances affecting the results of operations are fully discussed, and in such a manner as to assist in correcting the erroneous impression which seems to exist with many, that sepsis is the only danger worth considering in surgery.

The chapter on surgical bacteriology, by Prof. Nancrede, of the University of Michigan, is thorough, and in every sense of the term up to date. The only criticism which might be applied is that it is too thorough. It might have been better, perhaps, not to have attempted to squeeze so much into so limited a space; one would rather see something more general, which could be readily understood and remembered by the average student.

The article on gunshot wounds, although the author feels called upon to apologize for its brevity, is an excellent and comprehensive one. No mention is made, however, of the effects of the new, small-calibre, steel-coated bullets which are coming into use in various quarters and seem destined to supplant the older projectiles.

The articles on such surgical diseases as inflammation, erysipelas, tetanus, hydrophobia, etc., are what they should be. The author seems to adopt with some hesitation the generally accepted view that inflammation always depends upon the presence of pathogenic micro-organisms, although he states, in an inconspicuous footnote, that this is true in the large majority of cases. He emphasizes strongly and at length the part played by ordinary chemical and mechanical causes.

In the treatment of tetanus, after mentioning the older and newer methods, he remarks that "all means fail in acute cases; each has been occasionally successful in those of the chronic variety."

In regard to hydrophobia, he says: "Looking at the matter from a practical point of view, it must be confessed, I think, that the expectations raised by Pasteur's early publications have not been fulfilled." "The surgeon should therefore, I think, feel very certain that the victim of a dog-bite is really threatened with hydrophobia before advising a

mode of treatment which is not only of doubtful efficacy, but may in itself cause the very disease which it is intended to prevent."

The author holds very conservative views regarding chronic inflammations of bones and joints, and is not inclined to admit in its entirety the modern doctrine that these affections are tuberculous in by far the greater number of cases. As in the older editions of the work, struma, scrofula, and tuberculosis are carefully separated from each other. Many bone and joint affections, including "white swelling," are regarded as essentially scrofulous, and the tubercular origin of so-called cold abscesses is not mentioned.

In discussing penetrating wounds of the abdomen, doubt is expressed as to the reliability of Seun's hydrogen test, which may even do positive harm. In gunshot wounds, where there is uncertainty as to perforation of the intestines, a median exploratory laparotomy is advised, but in stab wounds the expectant plan is preferred.

It is of interest to note the position of so eminent and conservative a surgeon on the relative values of tracheotomy and intubation. Tracheotomy is preferred in most cases, and he adopts those statistics which show for it a lesser mortality.

The chapters on fractures and dislocations are clear and concise; but it is remarkable that mention is not made, in connection with Colles' fracture, of a method of treatment which is considered by many surgeons as by far the best, namely, reduction during over-extension of the wrist, and after-treatment without splints or with merely a retentive dressing which leaves the hand free.

In these days of daring brain surgery, the author still holds some very conservative views. In reference to trephining for extravasation of blood between the skull and surface of the brain, he says: "In the majority of instances the operation has been useless, or has even hastened death. Hence I cannot but think that as a rule the surgeon will do wisely to abstain from the use of the trephine in these cases, relying upon medical treatment, as in dealing with ordinary apoplexy." He also prefers not to operate in simple depressed fractures, with or without symptoms, and in impacted compound fractures, as he considers that an operation could do no good, "but would, by admitting the atmosphere, seriously complicate the prospects of recovery"—and this after agreeing with Lister, earlier in the volume, that the atmosphere may be disregarded as a source of danger.

Trephining for intra-cranial suppuration is also discouraged, unless an opening in the skull plainly communicate with the purulent focus. Of trephining for epilepsy, he says: "I can only say that I consider the operation usually inadvisable," and he takes a similar negative stand in regard to opening the skull for tumors and other "localized" lesions.

The good points in Ashhurst's *Surgery* so far outweigh the bad that the latter are scarcely noticeable unless one is on the lookout for them.

L. F.

ATLAS OF HEAD SECTIONS. FIFTY-THREE ENGRAVED COPPER PLATES OF FROZEN SECTIONS OF THE HEAD AND FIFTY-THREE ENGRAVED KEY PLATES, WITH DESCRIPTIVE TEXT. By WILLIAM MACEWEN, M.D. Quarto. New York: MacMillan & Co., 1893.

THE title of this book is unfortunate, as a bit of English, for the use of the word "head" as an adjective, although one sees it every now and then in journals and newspapers, is certainly indefensible, especially in the title of an important work. The work itself is an admirable one, and now that Dalton's *Topographical Anatomy of the Brain*, by a similar method, is out of print, we welcome the present work, since it will put into the hands of the general profession the means of making themselves familiar with frozen sections of the head. The only works with which the present volume can be compared are those of Aleck Frazer and Dalton. Frazer's plates are much larger, and also have the advantage of having a scale applied to them, and of being put, by means of superposition in outline, in relation with the external configuration of the skull, but the work is unwieldy and is also not so complete as the present one. Dalton, however, is not likely soon to find a rival. It is more perfect and beautiful as a work of art, although not more accurate, and in some respects not so full as the present work.

Dr. Macewen's atlas consists of fifty-three frozen sections of the head, with a key plate corresponding to the original plate, and in each case opposite to it. The sections are: coronal, twenty-four; sagittal, eleven; and horizontal, eighteen. All of the coronal sections are measured from the auriculo-bregmatic plane forward and backward; the sagittal, in inches, external to the median plane, and the horizontal sections are referred to a plane running through the middle of the external auditory meatus, and in a few cases to the plane of the orbits. They have the great advantage that they not only consist of sections in adults, but also of sections from two children of two and a half and five years of age, which gives the means of comparison of the anatomy of the brain in childhood and in adult life, well supplemented by Symington's and Dwight's atlases in particular.

The great value of these frozen sections of the brain *in situ* is to show the real relations of the parts of the brain *inter se*, and the brain and the skull in their relations to each other, which is the only proper method, since, when the brain is removed and sections are made, there is inevitable distortion from the effects of gravity and the loss of bony support to such a soft mass of tissue.

The first three plates are very striking in showing the dipping down of the frontal lobes near the middle line, and especially in emphasizing the thin osseous lamellæ which separate the brain cavity from the nasal cavity; and it is surprising that both surgeons and physicians have too frequently overlooked this ready means of infection. If, owing to the thinness of the osseous lamella separating the ear from the cranial cavity, diseases of the ear have so frequently resulted in abscess of the brain and meningitis, it would be singular indeed—in view of the frequent attacks of acute nasal catarrh with profuse suppuration, as frequently seen in an ordinary "cold in the head," and all the more in the very numerous cases of chronic nasal catarrh—if infection did not take place by this

ready nasal route. In fact, the recent views of Hirt and others, that all cases of meningitis, excepting, of course, the tubercular, are due to a diplococcus or streptococcus which is of infectious origin, seem to be supported and rendered probable by the observation of this fact.

Again, Dr. Macewen calls attention in several of the plates to the relations of the temporo-sphenoidal lobe to the bone and dura mater, and expressively says: "The base of the temporo-sphenoidal lobe is enclosed, as it were, in a box without a lid. Any pressure arising in the basal portion of the temporo-sphenoidal lobe will cause an expansion chiefly in an upward direction toward the convolutions of the operculum. The cerebral tissue near the middle line in the vicinity of the internal capsule, having no resisting structure on its inner side, has ample accommodation for displacement toward the lateral ventricle and the opposite side of the brain, and therefore pressure effects from expansion of the base of the temporo-sphenoidal lobe will affect much less the internal capsule than the upper and outer part of the cerebrum, which is bounded outside and above by the skull and on the inside by the falx." The relation, also, of the sinuses, especially the sigmoid portion of the lateral sinus, to the ear and the brain, and the relation of the mastoid cells to the brain, are admirably shown and must impress us with the importance, so little recognized until of late, of the effect of chronic disease of the ear especially in its relation to suppurative diseases of the brain and thrombosis of the lateral sinus.

The value of the book is immensely increased by the very full references in the key plates, and we can commend it most heartily to all who are engaged in work on cerebral surgery as something which will aid them in the study of the anatomy of the brain, and especially of the relation of that anatomy to surgical practice.

W. W. K.

ILLUSTRATIONS OF THE NERVE TRACTS IN THE MID- AND HIND-BRAIN AND THE CRANIAL NERVES ARISING THEREFROM. By ALEXANDER BRUCE, M.A., M.D., F.R.C.P. ED. Edinburgh and London: Young J. Pentland, 1893.

THE volume before us consists of an atlas of twenty-seven beautiful lithographic plates. According to the modest language of the author, it is designed primarily for the use of students of neurology who are commencing for themselves the practical examination of the difficult region included between the lower end of the medulla oblongata and the nucleus of the origin of the third cranial nerve. We fancy, however, that there is not a neurologist living, no matter how great his attainments, who will not look upon these plates as a distinct and valuable acquisition to his library. Suffice it to say that the position, relation, and later development of all the nuclei associated with the cranial nerves just mentioned are illustrated in a way not to be found in any text-book of anatomy, or, for that matter, in any previous publication.

The illustrations have been made from sections of brains of fœtuses of five and a half months and upward, and from the brains of young children. They have been stained by the Weigert or Pal hæmatoxylin methods. They have been reproduced with an accuracy and

faithfulness that, it is safe to say, has not yet been anywhere approached. The clearness with which the courses of the commissures, bundles, and fibres are shown must be seen to be appreciated. Further, the plates, which are reproduced in the original colors of the stained preparations, are simply exquisite in finish, and reflect credit not only upon the author but also upon Mr. Cathie, the artist.

Only one familiar with histology can judge of the keen satisfaction that these exquisite representations afford, since in every detail of execution it is evident that the figures are not diagrams, but laborious and successful attempts to represent what was actually seen in the sections. They also reveal the high degree of technical skill which the author has attained in the preparation of sections of large area by means of the Weigert and Pal methods, supplemented by Upson's carmine.

The clearness with which the nests of ganglionic cells and fasciculi are thus brought out is not only pleasant to the eye, but also serves to illustrate the astonishing progress that the last twenty years have witnessed in histological methods, especially as applied to the nervous system. Each plate, in fine, may of itself be regarded as a work of art, apart from its scientific value. The explanations of the figures on the plates themselves are so clear and full that to a specialist or a skilled anatomist little more is required.

As a preface to this remarkable atlas, the author has placed two chapters of fifty-one pages; the first being a description of the cranial nerves, and the second a description of the tracts in the medulla, pons, and crura. Further, each chapter is enriched by numerous diagrams, which assist in elucidating the concise and clear text.

The volume is convenient in form; the type and paper beyond criticism; and it would be obviously unjust in speaking of this truly exquisite production not to pay a proper tribute to the publishers.

F. X. D.

A MANUAL OF MEDICAL TREATMENT, OR CLINICAL THERAPEUTICS. By I. BURNEY YEO, M.D., F.R.C.P., Professor of Clinical Therapeutics in King's College, London, and Physician to King's College Hospital. Vols. I., pp. xiv., 631; II., pp. vii., 744. With illustrations. Philadelphia: Lea Brothers & Co., 1893.

In reading a handbook of therapeutics we expect to find originality, not in matter but in form of expression. We are to see the author's selection of the important, and that which rests upon a sound scientific basis. The field is so vast that no one clinician can hope to personally verify the accuracy of the multitude of observers, nor weigh carefully all their reports. If an author can present the subject in the light of a mature judgment, discarding hasty generalizations from insufficient data, keeping in mind the ever-advancing sciences of physiology and chemistry, and so bring his work before the profession that it shall be a practical, readily comprehended, and reliable guide, he has met our expectations. The matter, in the greater portion, is not original, as frequent quotations from the System of Hare, and from Whitla, Dujardin-Beaumetz, Fagge, and to a lesser extent from others, readily show. That

the subject of treatment is presented concisely and clearly must be admitted. That it is a manual—a handbook—of marked convenience is due to its mechanical perfection, well worthy of the Leas.

In the first volume we find the treatment of diseases of the digestive, circulatory, and respiratory systems, pulmonary tuberculosis being excepted. At the outset we believe that the American practitioner will be somewhat surprised to have placed before him preparations of the British Pharmacopœia, *e. g.*, liquor strychninæ, succi belladonnæ, morphinæ acetatis liquor, and many others of unfamiliar dose and strength. He will also doubtless remark the large number of complicated formulas, many of which do not follow the classical construction of a well-chosen prescription, and which recall the poly-pharmacy of the past. We believe that the trend of modern therapeutics toward simplicity of prescription, lessening of dose with shortening of interval, not only aids greater precision in observation but as well diminishes the number of unpalatable mixtures. We note omissions of methods which are important: p. 41, the use of defibrinated blood (A. H. Smith) in rectal feeding; p. 126, menthol for vomiting, although it is mentioned under vomiting in pregnancy; p. 228, ipecacuanha *sine* emetina, and p. 242, naphthalin, excepting as enema, in dysentery; p. 178, olive oil in lead colic. We believe that resorcin, p. 57, is recommended to be administered in chronic gastric catarrh in too small a dose, and that it deserves much more notice than the author accords it. The caution that "care must be taken that the stomach-tube be not swallowed," p. 114, appears superfluous, nor do we consider the statement of Leube as to the cause of colica rheumatica of sufficient importance to be found on both pp. 164 and 204. We cannot believe that in appendicitis "when there is satisfactory evidence of suppuration having occurred" that a delay of "five or six days" before surgical intervention is ever justifiable. In the doubts expressed on p. 165 as to the practical value of the chemical examination of the contents of the stomach in dyspepsia, we see a failure to appreciate the masterly work of Hayem and Winter and of Ewald. We most heartily indorse the condemnation of chloral in the insomnia of cardiac disease, p. 340, although the same objection does not apply to chloralamide, and as well the strictures upon Oertel's "Terrain Kur." In the light of the recent work upon expectorants we are astonished to find that tartarized antimony and small doses of morphine are recommended in the treatment of acute bronchial catarrh (p. 480). With apomorphine, cocillana, and naregamia at hand we believe that the treatment of this condition should be modern. Terebene can frequently be substituted for turpentine, and a good (not commercial) syrup of hydriodic acid for the iodide of potash, with advantage. The use of the nitrites in cardiac diseases, other than in the symptom of angina pectoris, by no means receives the attention which it deserves. In the treatment of pneumonia the important point of the observations of Petresco (p. 573), the *massive* doses of digitalis, is entirely omitted; so also we do not find the valuable observation of A. H. Smith (p. 582) which gives the best indication for the use of the nitrites, the loudness of the pulmonic second sound. In washing out the cavity after incision for empyema, if peroxide of hydrogen be used, free outlet must be obtained, otherwise the gas resulting from its use may cause serious disturbance, a matter too frequently, as here (p. 628), overlooked. Modern antiseptic precautions demand that the skin shall be cleansed as well as the exploring needle

(p. 616) in exploratory puncture. We believe that carbolic oil (p. 11) "smeared" over the surface is not now believed to be of value as an antiseptic, and we doubt if the use of "a rag" (p. 6) should be recommended for any medical purpose.

The second volume presents the treatment of phthisis, diseases of the liver, urinary and renal affections, diseases of the nervous system, constitutional and specific infectious diseases. The important points in the treatment of pulmonary consumption are set forth in a manner which challenges admiration. The omissions are few: (p. 24) creosote is often advantageously administered in the form of enteric pills, a method by far preferable to that of capsules with cod-liver oil, and Churchill's teaching in regard to the hypophosphites might have been followed more closely with profit. Matzoon is often better borne by the stomach than koumyss. The strontium salt is less likely to produce untoward symptoms than other bromide salts in epilepsy, and we believe that it deserves more consideration than it receives on p. 417. In the treatment of malarial fevers the carbamide of quinine for hypodermatic use should have been mentioned. The position taken by the author, that opium and morphine, if used freely, may relieve the restlessness of uræmia by the repose of death, is a commendable one. The devotees of Brand's method of treating typhoid fever will very properly find but little satisfaction.

The book shows a careful study of a few standard authors rather than an extensive reading of ephemeral literature. The view of the subject which he presents is a broad one and remarkably free from national coloring. It is of more even literary and scientific merit than a system, the work of many authors, could be, and also more closely in accord with the best of existing knowledge. The space devoted to clinical history and diagnosis may appear at times to be too great, yet if it be an error it is one which only adds to the size of the work. The index is not a full one; we are pleased that it is not an index of diseases and their remedies, it is sufficient for its purpose—to direct the search for information. The practitioner, the junior will find his knowledge broadened, the senior will lift himself out of his routine by a careful study of this book. From our acquaintance with the author's contributions to medical literature we have been led to expect much, and we have not been disappointed.

R. W. W.

ERFAHRUNGEN UEBER DIE GALLENSTEINKRANKHEIT, MIT UND OHNE ICTERUS. VON PROFESSOR RIEDEL, in Jena. Pp. viii., 183. Berlin, 1892.
EXPERIENCE IN CHOLELITHIASIS, WITH AND WITHOUT ICTERUS. By PROFESSOR RIEDEL, of Jena.

THIS is a small volume filled with the richest experience in cases of gall-stone, given in the form of very full histories of a large number of cases arranged under the heads of pathological anatomy, arrangements of stones, clinical course, diagnosis, treatment, adhesions, and many sub-heads. To it is added an exhaustive tabulated list of the sixty-four operations studied in the book. Considering the great interest shown of late in surgery of the gall-passages and the wide and many fields from

which magazine material is gleaned, it has been a matter of surprise that this work has received no recognition whatever from the press and no attention from individual workers, to judge from their published articles. This is the more surprising, since works on the subject are very few indeed. Even foreign journals seem to have all but passed it by. The fact is that it is one of the most valuable contributions to surgery (and medicine) made for a long time, both as to the quantity and quality of the surgical work upon which it is founded and as to the clear and valuable deductions therefrom.

After opening with contrasting pictures of the early and late operation of the simple procedure the author has devised, with every circumstance favorable on the one hand, and the terrible obstacles to be met with in abandoned patients on the other, the changes in the *gall-bladder* are first stated. It has been met with so calcareous as to require breaking with a chisel; a few times so thick and dense as to crunch under the knife; never with the walls thinned—a condition generally thought quite common. Several unusual cases of diverticulum are worth mentioning: one large one without mucous membrane and with two openings into the gall-bladder; one without mucous membrane and containing a large cup-shaped stone blocking the opening, while in the latter was resting another stone; many wallet-shaped, bent upon the duct or bladder at an acute angle, and of course entirely blocking the outlet. In one-half of the cases stones were in the bladder alone. The *cystic duct* was compromised in 66 per cent. of the cases, but in only one-third of these was this from stones resting there, but “mostly from swelling resulting from the mutual disturbance which follows inflammatory processes in the bladder. If the stones are removed from the latter the swollen duct so quickly collapses that by the first change of dressing, gall flows from the fistula (fifteen times in twenty-eight cases) without any extraction of stone from the duct.” This is the key to a great deal of the author’s plan of work. Only once was the cystic duct obliterated without the bladder also. Of many arrangements of the stones in this passage one is noteworthy; one of the larger stones blocked the upper mouth of the duct, and this formed an intussusception into the bladder. The *common duct* was once so enlarged and thickened as to be mistaken for the bladder, and so stitched to the parietes. Only a few times were stones found in this duct alone. Once a large stone was found in the duct and one in the bladder with obliteration between. On one occasion the common and hepatic ducts were one and enlarged, and the bladder and its duct obliterated. The contents of this duct were never seen to be serum nor pus.

Of changes in the *liver* the author has made a distinct discovery: that its enlargement often takes the form of a long narrow “tongue-like projection” lying directly over the bladder as the latter enlarges. This projection, or even the more general enlargement, almost invariably occurs in cases “with icterus,” for obvious reasons. Its cause is not made entirely clear, but that it may be of very rapid growth the observations of a colleague, made entirely in the dark as to what it might be, testify. To this observer is made this graceful and significant acknowledgment: “It is seen what great worth the observations of a single man have, even when he is practising in a small village, if they are quietly and objectively made. For through such observations we are advanced in our knowledge, and without them stand still, for we (the surgeons)

have before us many completed pictures, while our colleagues have the opportunity in their practice of studying the development of the disease." Several cases published as enlargement of the liver the writer suspects to be possessed of this tongue-like projection: is certain of it, and was puzzled by it in two cases of his own. *Perforations* close the section on pathology. These are rather infrequent, two through the abdominal wall being reported, one into the colon and through the abdominal wall, one into an encysted part of the peritoneum and into the colon and thoracic cavity, and one still worse, but of doubtful origin.

That the *clinical course* of cholelithiasis must be various is very evident after the above features, which are but a part of the many given. When it is added that the fullest histories of each case are given, including the operative procedures, it will be seen how valuable, even intensely interesting in respect to the latter, the book is. This varying clinical course is responsible in part for the differences between the practitioners of internal medicine and the surgeons, because the former see mostly the typical cases, those accompanied by the extrusion of small stones, while the latter have the anomalous cases and those with stones too large to pass away. But, for his ground for complaint against the physicians, the author takes the transactions of a late German congress and plainly shows by his exact observations some of their surmises to be incorrect. Hardly half of the cases of colic are from wandering stones, but from inflamed bladder containing stones; it may be from inflammation alone when there are no stones; from inflammation alone even while a stone reposes in the common duct. In like manner the appearance of jaundice may follow inflammation alone when there are no stones in the duct, or stones too large to wander into the duct. Inflammation as influencing the course of the ailment must be considered in its two aspects also, of chronic and acute.

After this insight into what may be below the surface we may be prepared for difficulties in *diagnosis*, especially since one-fifth of the cases before operation had had no colic, the symptom of more value than any other, and nearly as many had neither jaundice nor a tumor! The cases of cholelithiasis without icterus were mistaken by others twice for pyelitis calculosa, twice for tearing of the abdominal muscles, once for typhlitis, four times for wandering kidney, and two came with no diagnosis. The "tongue-like projection" contributed to this and other confusion. The appearance of icterus in the development of a case means obviously a step for good or for bad. The first question to be decided is: Is the icterus "real lithogenic," *i. e.*, caused by stone obstruction, or the "inflammatory" or "accompanying," *i. e.*, caused by inflammation accompanying stone? The latter causes little change in the liver because of its transient character; the former causes enlargement, and at the same time collapse or contraction of the bladder when it loses its concretions—the reverse pathological condition from cases "without icterus."

For *treatment*, "internal medicine and alkaline mineral waters are indicated in those cases which, without premonitory symptoms of long duration (weight in the stomach, nausea, occasional pain) suffer from an acute attack of colic with quickly following icterus. While premonitory symptoms fail it is generally to be assumed that the icterus is not an inflammatory one; further, that only small stones are present in the bladder, and they will eventually pass quickly through." For cases other than these, operation is alone to be considered, and again is early opera-

tion compared with late—*i. e.*, operation on the bladder, a trifling thing, compared with operation on the ducts, a very difficult thing; but “what will one or what will a few persons avail against a custom consecrated through centuries? On the strong walls of Carlsbad will every attack be shattered, indifferently whether thousands lose health or life through Carlsbad or not.” But in spite of these protests against trifling, quietly lying stones—such as are discernible but give the patient no indication of their presence—it is declared, are “not to be the subject for therapy” of any sort.

“Ideal cystotomy,” even when practicable, is rejected entirely because it is apt to bring reproach upon surgery for incompleted work, because continuous drainage of the bladder is necessary for the restoration of its health and that of its appendages, and because dangerous back-pressure may occur from a great number of causes, even from swelling extending from the disturbance of the operation, or from minute blood-clots (colic secondary to operation)—circumstances clearly proven. Even with ten, twenty or more successive cases of successful “ideal cystotomy,” the author would feel that the next, were it unsuccessful, could have been avoided by other procedure. The operation which is adopted for the bladder and its duct is cholecystotomy in two sittings! In these days, when such a procedure is looked upon as working very much in the dark, this will be hard to accept, but experience is the surest guide, and does not fail here. The chief reason is that continuous drainage promotes so far the collapse of the swollen mucous membrane that it allows the deeper-lying stones to present or extrude themselves. The writer has seen this; and in the thirty cases of double operation given, sixteen were at once successful, and of the remaining, thirteen corrected themselves later in this manner! The several other reasons will be passed over; the one of immeasurably greater safety will suggest itself; indeed the operation with its minute incision and refined technique, is declared devoid of danger. The remaining *fistula*, so often condemned, is held the great advantage, and the rarely-needed operation for its closure is easy.

The choice of operation for cases “with icterus” will depend on whether, again, the icterus is a “real lithogenic” or “accompanying inflammation.” Since in fully one-third of the cases it is the latter, cystotomy, in two sittings, may often be adopted—provided, of course, the distinction can be made. For stones in the common duct the only procedure is the direct incision of the passage, and the further course depends on the cystic duct. If this is obliterated nothing remains but to close the common duct by sewing. If this is open, again is a fistula through the bladder provided; or, as stones are likely to be in the latter also, the bladder is first opened and provisionally closed, the common duct then opened and closed, and the bladder finally opened and affixed in the abdominal wall. A relatively long incision is always made in operations for “real icterus,” and a tube is never used for early drainage, having once caused dangerous irritation. Crushing of stones is rejected, because remaining fragments may lead to new formations, and no man can operate a second time on the common duct. As the pages are turned, still more difficult operations appear: for gall-stones with appendicitis, with suppurative angiocholitis, with extensive pelvic sup-puration, with carcinoma, for old stones in bladder and new in the common duct, etc. The technique of establishing fistula when the bladder

is too short to reach the parietes, as is often the case, is beautifully devised. The results, remarkably good, are given, as everything else, at great length, and the opinion is broached that this line of surgery, with its possibility of great difficulties, is not suitable for the general practitioner.

J. C. R., JR.

THE RECRUDESCENCE OF LEPROSY, AND ITS CAUSATION. A POPULAR TREATISE. By WILLIAM TEBB. Octavo, pp. 412. London, 1893.

THE author of this volume has travelled much over the world, and has utilized some of his time for the investigation of the problems of leprosy as it exists especially in Oriental countries and also in Europe. It is evident on the first page that he is opposed most strongly to the operation of vaccination, and that he regards this act as a prolific means of spreading leprosy. The increase of the disease, the question of its contagiousness, its inoculability, vaccination with reference to the disease, vaccinal diseases, and the general and special treatment and management of leprosy, are all considered. References to the well-known writers of to-day upon the subject, and official statistics, are abundant, and indicate that the author has entered upon the subject from a scientific standpoint, although his conclusions do not seem to be in all instances in keeping with the facts as presented.

The results of the investigations made may be summarized briefly as follows: Leprosy has greatly increased during the last fifty years, and it is now prevalent in many places where it formerly was unknown. The preponderance of authority is in favor of the theory that it is not contagious in the ordinary sense of the term, but that it is communicable by means of a cut, sore, or abraded surface, and that it is an inoculable disease. The most frequent opportunities of inoculating the virus of leprosy are afforded in the practice of vaccination, and this is a true cause of the diffusion of the disease, arm-to-arm vaccination being particularly dangerous. The author finally attempts to show that in certain countries leprosy has followed *pari passu* with the introduction and extension of vaccination. We commend the book to all those interested in the subject, believing that they will derive much information from its perusal.

L. A. D.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE
MEDICAL SCHOOL AND HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

A NEW TREATMENT OF DIPHTHERIA.

SIG. BIANCHINI ANTONIO presents his method, which is based upon the antiseptic action of phenic acid. Absorbent cotton, kept constantly moistened in a 2 per cent. solution, is worn about the neck, and by inspiration—for it is a valuable antiseptic—it is carried to the diseased surfaces (pharynx, tonsils, larynx). At the same time fifteen to thirty drops of tincture of the chloride of iron, dissolved in aromatic water and simple syrup, is given about every hour. In grave cases the affected parts are touched twice daily with the following mixture: Salicylic acid, 3; absolute alcohol, 20; resorcin, 2; and glycerin, 10 parts. By a careful examination of the urine the amount of phenic acid which is absorbed can be ascertained, and the use of the acid can thus be regulated. The advantages of this method are: 1. The ease of application of the remedies. 2. The action of the acid is continuous, regulated, local, and general. 3. From the first application the fever yields, but tends to again rise if the treatment is suspended. 4. The general condition improves from the beginning.—*La Riforma Medica*, 1893, No. 204, p. 647.

INHALATIONS OF CREOSOTE IN THE TREATMENT OF TUBERCULOSIS.

DR. CHARLES H. MERZ, while admitting the value of creosote *per se* in treating tuberculosis, has failed to find this method so satisfactory in its results as he had hoped. In some cases it was detrimental in increasing the intensity of the faucial, pharyngeal, and pulmonary symptoms instead of relieving them. In cases of apyretic phthisis it has proven to be of more benefit than in any other form of the disease. Over-exertion in inhalations must be guarded against most carefully, and therefore they should be strictly controlled by the physician. The temperature of the inhaled air must be

closely watched, and the initial dose should be quite small. The remedy must be cautiously used if unpleasant results are to be avoided. Many cases are of such a nature that the use of an inhaler is a physical impossibility, solely from the lack of strength to properly use it. It is believed that the amount that can be introduced into the system by this method is quite small. Undoubtedly, in cases where there is an irritable or inflamed condition of the mucous membrane of the pharynx and larynx, inhalations of hot vapor, laden with chloroform or some sedative drug, will prove to be the means of securing comfort and ease; but when one is confronted with the theory that the inhalation of warm antiseptic solutions is sufficient to arrest a process of decay or breaking down of lung tissue, or that the mere presence of a vapor more or less heavily laden with an antiseptic is going to disturb the business habits of the bacillus tuberculosis, he thinks that he may be pardoned for confessing to a small degree of skepticism. It is doubtful whether creosote administered by inhalation possesses any real advantage, or any advantage at all, over the other means of administering it as commonly practised to-day.—*The American Therapist*, 1893, No. 4, p. 111.

LAVAGE OF THE DIGESTIVE CANAL.

DR. ANTOINE DE GENERSIKH has proposed the name diaclysm as a term for lavage of the digestive canal when it is intended that the entire canal shall be washed out. The fluid introduced into the rectum will ascend until the colon is filled; then with increasing pressure the small intestine, and later the stomach, will receive the fluid. The amount necessary is seven quarts or less before copious vomiting appears, and if the irrigation is continued the fluid entering the rectum is rejected, and this will cease only when the irrigation is stopped, when the current will be forcibly carried downward. In this manner we can cause ten or more quarts of fluid to flow from below upward without injury to the patient, although this procedure is not likely to pass for an agreeable pastime. By this method it is possible to entirely free the alimentary tract of any *materia peccans*, unless the patient be suffering from disease of the heart, arterial sclerosis, advanced pulmonary disease, or from some other general or local condition which may be a contra-indication. A solution of tannin, 1 to 2 per cent., made in boiling water and cooled to 98.6° or 100° F., is introduced, under the pressure of thirty-one to thirty-nine inches, into the rectum of a patient suffering from cholera, and the anus closed about the tube. The fluid is slowly introduced, and after five or six quarts have entered vomiting commences; and in the vomited water the presence of tannin is shown by the perchloride of iron test. After from seven to fifteen or more quarts have passed, the tube is removed, and the return current sets in, leaving behind only two or three quarts. The patient weak, cold, and asphyctic, already during the operation warms up, commences to perspire; the pulse is strong, and he becomes better, perhaps even he may be considered as rescued. The acid used in the irrigation is not considered to be of importance, the physiological salt, or any other solution which is not poisonous, would do as well. Tannin is, however, recommended because it has already been adopted by Cantani in the practice of enteroclysm, and serves not only as a disinfectant, but also as a styptic.

It is believed that not only does this method promise success in the treatment of cholera, but also in other intestinal poisonings and infections, acute or chronic, and in other diseases of the digestive canal. While an excessive pressure might cause perforation of the intestine in typhoid fever, tuberculosis, or intestinal gangrene, these conditions only demand that the flushing be done at the least possible pressure.—*La Progrès Médical*, 1893, No. 38, p. 201; and *Wiener medizinische Presse*, 1893, No. 39, S. 1517.

M. JULES DAURIAC, under the heading of "Total and Antiseptic Irrigation of the Digestive Tube," reports various experiments which had been conducted in order to ascertain the practicability and safety of this procedure. In a dog which had suffered from a very profuse diarrhœa, a lavage of a lactic acid solution of 1 per cent. resulted in cure. It was easy to make fluid escape by the mouth, and in this case seven quarts were used. In the obstinate fœtid diarrhœas so often found in idiots the lactic acid solution has resulted in cure, one lavage only being necessary (eleven cases). In some the diarrhœa reappeared after some time, but yielded to a new antiseptic irrigation. With a solution of creolin he has obtained equally good results. In five newborn infants suffering from green diarrhœa, one irrigation only of lactic acid has been sufficient for stopping it. In typhoid fever creolin has been used; the stools became less frequent, of more consistency, and lost their fœtid odor; the tongue again became moist and normal, and the general condition almost at once improved. The headache was lessened, the appetite returned, and the fever fell to about normal; the duration of the disease was lessened. In two instances of catarrhal icterus, simple cold water in one, in the other Vichy was employed, with the result of a rapid and real cure. In one case where the cause of the emaciation and diarrhœa was not determined, lavage produced a complete tænia, and the symptoms forthwith disappeared. This method can be used before surgical operations, or when certain purgation is necessary, as in intestinal obstruction.—*Le Progrès Médical*, 1893, No. 39, p. 217.

THE THERAPEUTIC ACTION OF MALAKIN.

DR. A. JAQUET reports concerning this new remedy, which may be called salicylphenetidin in that it is produced from phenetidin and salicylaldehyde with the withdrawal of water. The name is derived from *μαλακός*, mild, and it is found in small, transparent-yellow, fine needles. It is insoluble in water, with difficulty in cold, but rather soluble in hot alcohol. Experiments on animals (rabbits) prove that it is without influence upon the respiration or circulation, yet reduces temperature. The dose is fifteen grains, rarely one-half of that quantity, best administered in wafers. Sometimes after ingestion a peculiar odor is noticed (salicylaldehyde). In fourteen cases of acute articular rheumatism, a rapid and powerful effect was produced, four to six doses *pro die* being required. Occasionally perspiration is produced, but the untoward effects of the salicylic acid preparations have not been noticed. As an antipyretic it has an unmistakable action. In contrast to the rapid and energetic antipyretic effect of antipyrin and phenacetin is the slow and gradual effect of malakin, which does not give rise to collapse or chilly sensations. These observations were upon forty-eight cases (typhoid, croupous pneumonia, tuberculosis, erysipelas, and scarlatina). As an anti-neuralgic, twelve cases

are reported. In these cases the action is slow, so that for speedy relief other remedies must be resorted to. It can be stated, however, that it can be administered for neuralgias and habitual headaches for a long time without injury to the stomach.—*Correspondenzblatt für Schweizer Aerzte*, 1893, No. 18, S. 609.

THE TREATMENT OF DIARRHŒA.

DR. ALOIS PICK believes that opium plays a great rôle in the treatment. Next come the bismuth preparations, and especially the salicylate, at first in large doses in order that the powder may form a protective coating to the alimentary canal. In stomach disturbances, alum can be used with advantage. Tannin is seldom employed on account of its disordering the stomach. Sometimes the iron preparations are useful. The use of Glauber salts, as recommended by Trousseau, may be begun by the use of two and one-half-drachm doses, dissolved in water, and continued for one or two weeks in one-half the dose. In many chronic cases a preliminary emptying of the bowels, followed by styptic treatment, is necessary. In diarrhœa secondary to constipation, to strengthen the intestinal muscles, massage, electricity, and cold-water cures may be indicated. In nervous diarrhœa (of women), the electrical treatment with galvanism, or a strong faradic current, is valuable in diminishing the increased excitability of the intestines.—*Centralblatt für die gesammte Therapie*, 1893, Hest 24, S. 578.

THE ABSORPTION OF SALICYLIC ACID BY THE SKIN.

DR. BOURGET reports nineteen cases of inflammatory rheumatism treated exclusively by external use of salicylic acid, and he concludes that it is absorbed in a sufficiently large quantity from the skin for a rapid and perhaps for a more rapid cure than when given by the mouth. It suppresses the pain with surprising rapidity, diminishes the swelling, and the fever gradually falls. The ointment containing the drug is applied over the circumference of the affected joints, and the limb is covered with a flannel bandage. The urine for the twenty-four hours was carefully collected and examined to determine the presence of the remedy. The following conclusions are presented: 1. The absorption of the salicylic acid by the skin is rapid and marked. The skin of the young absorbs better than that of old subjects, of blondes better than brunettes. 2. The rapidity and intensity of absorption depends upon the vehicle in which it is dissolved. Fatty bodies are the only ones which allow the greatest penetration, while with vaselin or glycerin it is absent or slight. 3. The treatment of acute articular rheumatism with a terebinthinated salicylic ointment is strongly recommended. 4. This ointment is less efficacious in other forms of rheumatism, but it may be of assistance in the treatment of these affections by massage. 5. It has no value in gonorrhœal rheumatism. The formula recommended is: Salicylic acid, essence of turpentine and lanolin, of each ten parts, of lard one hundred parts. The amount of salicylic acid which is eliminated by way of the urine in twenty-four hours varies from three to nine grains.—*Revue Médicale de la Suisse Romande*, 1893, No. 9, p. 567.

SALIPYRIN IN AMENORRHŒA.

DR. HORATIO R. BIGELOW reports an instance where, after two fifteen-grain doses with an interval of two hours, a facial neuralgia disappeared and menstruation was established. Zurhelle has found that this remedy is more efficient than ergot, but points out that it is contra-indicated in certain pathological changes of the uterus. Many neuralgic women are deficient menstruators and menstruate painfully. In administering to the diseased nervous centres, or to an impaired circulation, you restore the monthly function to normal. Too much blood, unhealthy blood, anæmia, predispose to neuralgia, and disturb the menstrual function. A rheumatic, neuralgic, gouty, or malarious individual never performs these functions satisfactorily. The uterus is quite rarely at fault; the impaired nerve nutrition must be attended to. For the same reason that salipyrin will cure neuralgia, it will also cure amenorrhœa; it addresses itself to nutrition. The treatment by salipyrin was continued for two weeks, in the same dose, given three times daily. The sleep was undisturbed, appetite was improved, and the relief of both amenorrhœa and the neuralgia was complete.—*Notes on New Remedies*, 1893, No. 5, p. 66.

THE SEDATIVE ACTION OF DUBOISINE IN CONTINUED DOSES IN INSANITY.

DR. E. MARANDON DE MONTYEL, in his service at Ville-Evraud, has administered this remedy as a sedative in continued doses during the day to thirty-five patients. The results have been marvellous, and in cases of agitation it often changes violent excitement into a perfect tranquillity. Unlike hyoscine, it does not paralyze the voluntary muscles, nor does it, like somnal, narcotize the patient. Its action is not immediate, for it may not be complete until the second, sometimes until the third day. When its effect has been obtained it persists quite regularly, so that ordinarily the patients do not experience regularly good and bad days. Further, it frequently happens that the improvement may continue for several days after the cessation of the medicine, and a period of calm, more or less prolonged, may be established. An important fact in its administration is, that when once a tolerance is established the patients ordinarily fail to be influenced by the drug, no matter how large the dose, and the marvellous sedation of the first days cannot again be obtained. The dose employed has been from one-thirty-second to one-sixth of a grain, in two equal portions at nine in the morning and at three in the afternoon, the patients receiving their food at seven and eleven in the morning and at five in the afternoon. The remedy appears to have an unfavorable action upon nutrition.—*Archives de Neurologie*, 1893, No. 79, p. 211.

THE ACTION OF TRIONAL.

DR. OSCAR COLLATZ reports the result of the use of this drug as a hypnotic in sixty-six cases of insanity, generally in fifteen- to thirty-grain doses. It does not interfere with either the circulation nor the respiration, and the digestion is not impaired. Albumin is not found in the urine, nor are blood-

corpuscles nor evidence of blood-coloring matter present. The condition of the blood, even after several weeks' use of the remedy is normal. Although it is free from injurious after-effects, even after long-continued use, it is not an absolutely reliable remedy.—*Berliner klinische Wochenschrift*, 1893, No. 40, S. 966.

THE UNTOWARD EFFECTS OF ANTIPYRIN, ACETANILIDE, AND PHENACETIN.

DR. D. R. PATERSON, from a study of the reports of twenty-five physicians to the South Wales Branch of the British Medical Association, presents the following conclusions: *Antipyrin*. Large doses depress the nervous system, positive results varying from an unpleasant diaphoresis to severe collapse. Most of them may be referred to the action on the nervous system, producing exhaustion and collapse following the fall of temperature; and there may be disturbance of the circulation for the same reason, or secondarily from the effect on the blood-corpuscles and the production of methæmoglobinæmia. Other symptoms, such as affections of the skin and pronounced psychical disturbance, are more rare. Minor degrees of depression are represented by unpleasant diaphoresis, which may be so profuse as to prostrate the patient temporarily. Continued use of even small doses not infrequently leads to a condition in which the patient complains of having lost his energy, is disinclined to exert himself and becomes depressed mentally; in short, there is established an antipyrin habit. Blueness of the lips and face is one of the concurrent untoward effects, varying from that which is first perceptible to a deep cyanosis with profound collapse. *Acetanilide* has been very early abandoned by many practitioners because of the frequent onset of symptoms of intoxication and the alarming appearance which they sometimes assume. The consensus of opinion is that symptoms of depression and collapse are more readily produced and are more marked than with the other drug; and this may be explained by the fall of temperature being greater and more rapid. Most of the reports mention cyanosis, and to a greater degree than after antipyrin. Anæmia may be induced by its continued use and become a grave condition. *Phenacetin* is more free from ill effects than either of the other two substances. Its depressant action on the nervous system and heart is manifest only when very large doses are given, small amounts, taken frequently, being borne without ill effects. It is not, however absolutely free from unpleasant consequences. Eisenhart reports a case which presented the symptoms of palpitation, oppression, dulness of hearing, then nausea and vomiting. With the onset of sickness all traces of intoxication vanished, and the patient felt well. Skin eruptions, chiefly urticarial, are said to be met with.—*The Practitioner*, 1893, No. 304, p. 241.

THE ACTION OF STRONTIUM UPON RENAL PARENCHYMA.

DOTT. CESARE FALCONE notes the observation of Malbec, that the kidneys of a dog which had received the nitrate for nearly a month did not show any anatomical changes, although the liver contained a notable quantity of strontium. On the other hand, a dog which had taken the neutral tartrate for

more than a hundred days, on necropsy was shown to have a certain degree of renal congestion. Experiments with the lactate (dogs) show that there is a gradual but clearly marked diminution in the amount of urine passed. On the thirteenth day a trace of albumin appeared, and ten days later the amount could be readily determined, and the increase was continued until a large percentage was reached. The urobilin steadily increased in amount until, at the fourteenth day, there was a true urobilinuria. Microscopical examination of the urine showed granular and hyaline casts and red blood-globules. All of the facts point to an irritative process going on in the kidneys. Careful microscopical examination of the kidneys, after removal by necropsy, demonstrates beyond doubt that this remedy in long-continued administration produces an initial form of nephritis.—*La Riforma Medica*, 1893, No. 205, p. 651.

THE TREATMENT OF SECONDARY SYPHILIDES.

DR. ALFRED FOURNIER believes that mercury is the specific *par excellence* in the treatment of these conditions. On the contrary, potassium iodide exercises an influence infinitely less potent. Of the mercurials he prefers, as most certain and efficacious, the sublimate and the protiodide; the former being especially reserved for tertiary manifestations, while the protiodide is better adapted for the conditions under discussion. The dose should be average ones, and indeed active, as one and a half grains for a man, a quarter of a grain less for a woman. Although in these conditions choice can be made between exclusively general and local treatment, reliance should be placed chiefly upon the former, although both are useful. The general treatment is directed not only to the lesion but to the disease as well; it for the present cures and for the future is a safeguard. If the general treatment alone suffices it is useless to impose upon the patient the external treatment. If in certain forms the internal treatment is impotent to cure rapidly, then external methods can be resorted to for relief, and to destroy at the same time the active centres of contagion.—*Revue générale de Clinique et de Thérapeutique*, 1893, No. 35, p. 545.

THE COMPARATIVE ACTION OF IODOFORM UPON THE STAPHYLOCOCCUS AND UPON THE BLOOD CORPUSCLES.

DR. E. MAUREL has attempted to reconcile the contradictory views held by biologists and clinicians concerning iodoform. It was found that the drug is not poisonous for leucocytes, but, on the contrary, their activity is increased in a manner proportional to the dose employed. But at the same time there is the same action upon them as in febrile temperatures, a compensation between the activity and the longevity of the leucocytes—one can only increase at the expense of the other. Even in large doses the drug is without action upon the red blood-corpuscles. So far as the drug acts upon the staphylococcus, the conclusion which has been reached by many other experimenters is now confirmed that it does not sensibly modify the reproductivity of the staphylococcus. When, at the same time, both the staphylococcus and the blood corpuscles are placed under the influence of iodoform, it has been found: 1. That it attenuates the virulence of the staphylococcus. 2. The

staphylococci, which have lost a great portion of their virulence toward the leucocytes, have entirely preserved their reproductivity. The general conclusions are: That we must recognize three distinct properties in each pathogenic microbe: Its virulence; its reproductivity; its tenacity of life. 2. The efficacy of iodoform against the staphylococcus, which has been thoroughly established by the clinicians, is due to its faculty of increasing the energy of the leucocytes and of diminishing the virulence of the staphylococcus. We find here the explanation of the apparent contradiction between the observations of the clinic and of the laboratory.—*Bulletin général de Thérapeutique*, 1893, 36e livr., p. 241.

THE ANTISEPTIC POWER OF ICHTHYOL.

DR. RUDOLF ABEL, from his careful experiments in the laboratory, has reached the following conclusions: 1. The ichthyol preparations (ammonium and sodium) in weak solutions and in a short time destroy the pyogenic and erysipelas streptococci. The action of various commercial preparations is practically identical. Ichthyol is used with success in the suppuration from these cocci. 2. The staphylococcus aureus and albus, the bacillus pyocyaneus, the bacillus of typhoid, ozæna, and anthrax, the spirillum of Asiatic cholera, show more or less resistance to ichthyol, in that when pure it must act upon them by the hour in order to destroy these organisms in cultures. 3. The diphtheria bacillus in fresh colonies is easily destroyed by weak ichthyol solutions, while mature ones are acted upon with difficulty. Therefore it is useful in diphtheria only in prophylaxis. 4. Ichthyol has rendered good service in the treatment of typhus and ozæna, although it can only with difficulty make harmless these infections. 5. It is recommended that it should be preserved only in substance or in a 50 per cent. solution; weaker solutions may be culture mediums for micro-organisms, as the staphylococcus aureus. Weak solutions should be sterilized by heat, which has no influence upon its properties.—*Centralblatt für Bakteriologie und Parasitenkunde*, 1893, No. 13, S. 413.

THE INFLUENCE OF CHLOROFORM UPON THE RESPIRATION AND CIRCULATION.

DRS. H. A. HARE and E. Q. THORNTON, after an elaborate and painstaking series of experiments, believe chloroform to be safe for the majority of cases, provided it be given by one who is skilled in its use, and who not only knows how to give it, but to detect signs of danger. It is not so safe as ether at any time, other things being equal, and never so safe in the hands of a tyro. The respiration should be watched, because so soon as enough chloroform is used to endanger the circulation the respiration will show some abnormality. Death in the healthy animal is always due to respiratory failure, accompanied by circulatory depression which may be severe enough to cause death, even if artificial respiration be skilfully used. Chloroform may be chosen in hot climates, when a large number of persons are to be rapidly anæsthetized; in Bright's disease, in aneurism, or great atheroma of blood-vessels; in children or adults who already have bronchitis; to persons who struggle violently. The safest method of administration is by Lawrie's or

Esmarch's inhaler, because these provide for circulation of air, and do not distract the attention of the anæsthetiser from the respiratory movements by complicated apparatus.—*Therapeutic Gazette*, 1893, No. 10, p. 672.

THE ACTION AND USES OF PENTAL.

DR. DAVID CERNA summarizes his conclusions as follows: 1. Pental possesses general anæsthetic properties. 2. The local anæsthetic effects produced by the drug are feeble. 3. Pental anæsthesia is rapidly established, but it also quickly disappears. It is chiefly of centric origin. 4. Pental depresses the circulation to a dangerous degree, causing a fall of the arterial pressure, and of the rate of the pulse, the latter phenomenon being followed by an increase even above the normal standard. 5. The lowering of the pressure is due to an action upon the heart and to a stimulation of the peripheral cardio-inhibitory centres. The vasomotor system is apparently not affected by the drug. 6. Under pental the pulse-rate is decreased at first, due similarly to a direct cardiac influence and to excitation of the cardio-inhibitory centres peripherally; the secondary increase to paralysis of the latter; and the final diminution to an action upon the heart. 7. The respiratory rate is increased through a direct action of the agent upon the respiratory centres. The respiration is afterward depressed by an influence exercised upon the same. The drug sometimes causes the Cheyne-Stokes type of respiratory movements. 8. Pental produces death mainly by cardiac paralysis. Sometimes, however, the heart and respiration stop simultaneously; at others a fatal issue is the result of respiratory failure. 9. The drug in poisonous amounts diminishes to a certain extent the irritability of the cardiac muscle. 10. Pental dilates the pupil, this phenomenon being probably of centric origin. 11. The narcosis of pental is not unattended by unpleasant after-effects, the action of these being principally that of excitement. 12. Pental cannot be considered as a safe or even as an efficient general anæsthetic, and is certainly inferior to ether and chloroform.—*American Medico-Surgical Bulletin*, 1893, No. 10, p. 918.

LIMITATIONS OF THE USE OF NITRO-GLYCERIN IN CHRONIC NEPHRITIS.

DR. D. D. STEWART states that in his opinion, when it is desired to employ this drug over a considerable period of time for its effects on blood-pressure, the best rule of administration is to so proportion the dose that the intervals are comparatively short—never less than four times daily—and the amount, though sufficient to produce some subjective or objective effect, never more than that just necessary to cause the *slightest* feeling of fulness in the head or to slightly quicken the pulse. When a rather rapid increase seems necessary to maintain a constant effect, an equally important point is to temporarily discontinue the drug for two or more days, at intervals of two or three weeks. On its resumption a much smaller initial dose will be required to produce physiological effects than that last taken.—*The Therapeutic Gazette*, 1893, No. 9, p. 604.

MEDICINE.

UNDER THE CHARGE OF

W. PASTEUR, M.D. LOND., F.R.C.P.,

ASSISTANT PHYSICIAN TO THE MIDDLESEX HOSPITAL; PHYSICIAN TO THE NORTHEASTERN
HOSPITAL FOR CHILDREN;

AND

SOLOMON SOLIS-COHEN, A.M., M.D.,

PROFESSOR OF CLINICAL MEDICINE AND APPLIED THERAPEUTICS IN THE PHILADELPHIA
POLYCLINIC; PHYSICIAN TO THE PHILADELPHIA HOSPITAL.

DEATH FROM LARYNGEAL SPASM IN A CASE OF HYSTERIA.

LEO (*Deutsche medicin. Wochenschrift*, 1893, No. 34, p. 809) has reported the case of a man, twenty-one years old, who had long suffered, particularly in the morning on arising, from headache and vertigo, unattended with vomiting. At the age of eleven years he had had an attack of chorea, involving the left upper extremity and the left side of the face, and lasting ten weeks. At the age of eighteen years, a week after receiving a blow upon the head, twitching again appeared, beginning in the fingers and successively invading the left upper extremity and the left lower extremity; the muscles innervated by lower branches of the left facial nerve, and to a slighter degree the upper branches; and from time to time appearing in the trapezius muscle. These manifestations disappeared after a course of treatment with potassium bromide. Two years later the twitching recurred with loss of consciousness, it was said, and lasted ten weeks. It then remained absent for nearly a year, when it returned, with headache and vertigo, but without loss of consciousness. Persistent clonic twitching was observed in the triangularis menti. The tongue presented slight choreic movements, but was protruded in the middle line. The left upper extremity was thrown about by alternate tonic and clonic movements. The tonic spasm involved particularly the flexors of the fingers and of the hand. There were also clonic movements in the thigh and leg of the left side. Tonic spasm was present in the muscles of the trunk, giving rise to a certain degree of bowing of the body. There were no contractures and no impairment of motor power. On examination it was found there was complete anæsthesia of the upper and lower extremities of both sides, and in less degree of the left side of the face and head. The reflexes in the upper extremities could not be elicited with certainty; those in the lower extremities presented no abnormality. The fundus oculi and the fields of vision were normal. Three days later the patient had a convulsion in which the head was thrown back into the pillow and the trunk slightly raised from the bed, while active movements took place in the muscles supplied by the facial nerve, particularly in the triangularis sterni. The arm was raised and abducted and the forearm flexed on the arm, with tonic spasm in the extensors of the second and fourth fingers. In the lower extremity there was tonic spasm of the muscles of the calf, the tip

of the foot being turned downward. There were also clonic convulsions in the quadriceps femoris. Convulsions of a similar nature recurred once or twice daily for some time. Treatment with narcotics and electricity proved unsuccessful. Considerable improvement, however, followed the subcutaneous administration of hyosine hydrobromate, of which at first gr. $\frac{1}{300}$ was used daily, and subsequently gr. $\frac{1}{150}$. The spasm diminished in frequency and severity, but the anæsthesia persisted. After the lapse of a month another left-sided convulsion occurred, for the control of which subcutaneous injections of morphine were employed. Twenty-four hours after this attack, another of even greater intensity occurred, marked by intense inspiratory dyspnœa, deep cyanosis, retraction of the neck, chest, and abdomen, together with singultus. Attempts to induce artificial respiration failed, and amid increasing dyspnœa death took place. Upon post-mortem examination the brain and membranes presented no abnormality other than slight œdema and hyperæmia. The larynx contained no foreign body and was not œdematous, but the vocal bands were firmly adducted, so that water could not pass the rima. The hysterical nature of the affection was recognized during life, and the post-mortem examination afforded a confirmation of the diagnosis.

PSEUDO CEREBRO-SPINAL SCLEROSIS OF MALARIAL ORIGIN.

TRANTAPHYLLOIDES (*Archives de Neurologie*, xxvi., No. 79, p. 232) has reported the case of a man, thirty-six years old, who was seized with malarial fever, at first of regularly quotidian type, but later of irregular type, compelling him on account of debility to take to his bed between the twentieth and twenty-fifth days. Upon examination at this time the man was found to present the facies of paludal cachexia. The expression was pathetic and weeping was frequent. Speech was slow and scanning, just as in cerebro-spinal sclerosis. In repose the patient presented no tremor, but upon attempted movement there resulted tremor proportional to the extent of the movement. Nystagmus was present. When the patient was assisted to raise his head he was seized with vertigo, trembling of the whole body, muscular rigidity, and beginning loss of consciousness, but an epileptiform seizure was averted by lowering the head. The tendon-reflexes of all four extremities were exaggerated. Common sensibility and the special senses presented no deviation from the normal. The liver and the spleen were enlarged, the latter being palpable and indurated. The tongue was moist and but slightly coated; the appetite was lost; the bowels were constipated. The treatment consisted in the subcutaneous injection daily of twenty-two grains of quinine dihydrochlorate. After the second injection the patient was able to raise his head without the development of the premonitory symptoms of an epileptiform seizure, and after the fourth injection the vertigo was so much relieved that he could hold himself erect for several minutes at a time. The intention tremor was also less pronounced, the general *morale* was improved and the appetite was returning. After the fifth injection had been given, quinine was also administered by the mouth in daily doses of eighteen grains. Four days later the patient was able to be about, supported upon a cane. In walking, the gait was that of postero-lateral sclerosis, the rigidity in the lower extremities disappearing when the patient was at rest. The vertigo was now

but transitory and the other symptoms were much less decided than they had been. Upon examination of the blood, pigmented bodies and crescents were found. A sixth subcutaneous injection of eighteen grains of quinine was given, and the daily dose of eighteen grains *per os* was continued. After two days more the vertigo had disappeared, the speech was less scanning, the gait was more nearly normal, and the reflexes were less decidedly exaggerated. A seventh injection of twelve grains of quinine was given. The improvement continued progressively until all of the abnormal manifestations had disappeared, perfect recovery ultimately ensuing.

A CASE OF PURE WORD-BLINDNESS.

HOISHOLT (*Occidental Medical Times*, vol. vii., No. 9, p. 483) has reported a case of word-blindness and music-blindness without agraphia. It occurred in a musician, sixty-three years old, who had held numerous important positions, which he had lost as the result of excessive indulgence in alcohol. There was no special hereditary predisposition and no history of syphilis. The man was quiet and gentlemanly in demeanor, but untidy in habits. While cognizant of time and place he was somewhat confused, and his memory of recent events was impaired. His language was coherent, and there was no evidence of the existence of hallucinations, further than that he seemed to think that he had been badly abused and had been deprived of his former position by persons who were jealous of him because he could play better than they. Speech was normal, both in form and arrangement. The intelligence of the man, and the comprehension of what was spoken to him, likewise seemed to be normal. He was able to spell words correctly, and also, upon dictation, to write properly his name and a number of short English words, but there was an inability to read what had been written, even his own name. He would generally read the letters of the alphabet correctly, but he was unable to read the smallest words. The ability to see, and to recognize objects at a distance was preserved. The man was passionately fond of music, and when given a violin played from memory the most difficult passages without a fault. When requested to play by note he tried to do so, but failed, hesitating and playing something not before him. He was unable to correctly name any written note. There was no palsy; the gait was normal; the knee-jerks were preserved and equal. There was imperfect control of the rectal and vesical sphincters. Sensation was preserved. The pupils reacted to light and in accommodation. Hearing was impaired, and there was complaint of imperfect vision. It was observed that on looking sharply the patient would turn his head to one side, and careful examination showed that there was left homonymous hemianopsia. For a time there was some improvement in the general condition, but finally the visual defect became more pronounced, the fields of vision becoming more and more contracted until there was total blindness, while the pupils grew larger and failed to react to light. Retention of urine appeared as an additional complication, so that daily catheterization became necessary. Subsequently weakness of the sphincter ani set in, with fecal incontinence. Death ultimately ensued as a result of the cystitis that developed. Upon post-mortem examination the whole occipital lobe of the left side of the brain

presented a yellowish-green color, and, viewed from above, appeared to be depressed below the general level. The convolutions of this area were reduced in size. These changes extended forward and upward into the angular and supra-marginal gyri, and inward along the median surface of the occipital lobe, the tip of which was quite softened. The posterior part of the right hemisphere was of a yellowish-red color, from the occipital lobe upward and forward, a little beyond the limits of the change of color upon the left side. The convolutions were flattened, but not so narrow or contracted as those upon the opposite side. The cortical substance around the posterior extremity of the first temporo-sphenoidal convolution (angular gyrus) was somewhat depressed below the level of the surrounding surface and presented several hemorrhagic spots from the size of a pinhead to that of a pea, some of them extending through the whole thickness of the cortex. Smaller hemorrhages were also visible on the median surface of the occipital lobe in the lobulus fusiformis.

CASES OF SPORADIC CRETINISM.

THE *Lancet*, 1893, No. 3662, contains the reports of four cases of sporadic cretinism treated by thyroid extract by WALLIS ORD. He observes in conclusion, that there was an absence of the symptoms of discomfort due to treatment usually met with in myxœdema. The doses given were quite equal to those used for adults, and only a slight rise of temperature was observed. Symptoms of improvement did not appear as soon as in myxœdema, no change of importance being noted during the first week. In three cases there was a marked diminution in weight at first; after a time there was a progressive increase apparently due to a deposit of healthy adipose tissue. The excretion of urea was decidedly increased under treatment in two cases. In a third the percentage before treatment was much above the normal, and became subsequently diminished. The rate of improvement was more marked in proportion to the age of the patients, the youngest improving the most. The eldest patient was nine years, the youngest nine months old. Two of the patients developed under treatment profuse sweating of the head accompanied by a most disagreeable, almost fecal odor. Three of the four patients were males.

The same issue contains an account of two cases of the same disorder, a male and a female, similarly treated by PATERSON (Ascot) and HELLIER (Leeds). In both, the results of treatment were satisfactory.

FOREIGN BODIES IN THE BLOOD IN PERNICIOUS ANÆMIA.

PERLES (*Berliner klinische Wochenschrift*, 1893, No. 40, p. 963) reports three cases of well-marked pernicious anæmia, in each of which he found in the blood delicate, highly refracting bodies, capable of spontaneous movement, and which, it is suggested, may be protozoan parasites, directly or indirectly destructive of the hæmoglobin contained in the red corpuscles. The blood was examined in the moist chamber or in the hanging drop. The bodies lay between the corpuscles, and were in active movement. They averaged from 3 to 4 μ in length, less than 1 μ in width, and about $\frac{1}{2}$ μ in thickness. Appendages of varying length were here and there visible, but well-developed

flagellæ could not be distinguished. The number of the organisms present appeared to be in direct proportion to the gravity of the case. Attempts to cultivate the organisms upon artificial media, and to stain them with the ordinary colors, proved unsuccessful. The same organisms were not found in the blood in a large number of cases of secondary anæmia examined.

TWO CASES OF SCAPULO-HUMERAL PALSY OF PERIPHERAL ORIGIN.

MEYER (*Deutsche medicin. Wochenschrift*, 1893, No. 34, p. 810) reports two cases of scapulo-humeral palsy of peculiar etiology, one corresponding to the type first described by Erb, and the other of an allied character. The first case occurred in a man, twenty-one years old, who received several stab wounds, one of which was situated at the upper angle of the inferior cervical triangle of the left side. There was considerable hemorrhage, for the control of which it was necessary to ligate the external jugular vein. At the time there appeared to be some paresis of the left upper extremity. After the wound had closed the left arm hung relaxed and flabby and was the seat of persistent sharp pain. Three-quarters of an inch above the clavicle, directly over the clavicular portion of the sterno-mastoid muscle, and corresponding to the situation of the brachial plexus, was a dense adherent cicatrix. The deltoid muscle was somewhat wasted and completely paralyzed. The pectoral muscles were well developed and intact. Of the elevators of the humerus the trapezius only appeared to be intact. The teres major and teres minor, the supra-spinatus and the infra-spinatus appeared to be paretic. At rest the contiguous borders of the scapula were parallel; the serrati were active. Attempts to elevate the arm gave rise to an appearance as if the shoulder-joint were ankylosed, though passive movement was unrestricted. Rotation was greatly impaired. Flexion of the forearm, whether pronated or supinated, was impossible; supination was restricted. The affected muscles presented reactions of degeneration. Upon the radial aspect of the arm, anteriorly and posteriorly, sensibility was distinctly impaired, particularly in the regions supplied by the supra-scapular, axillary, anterior and posterior brachial, cutaneous and median and lateral cutaneous nerves. Upon the thenar eminence the area supplied by the median nerve also was insensitive. The pressure-sense and the temperature-sense presented no appreciable alteration.

In the cases described by Erb, the palsy involved the deltoid, the biceps, the brachialis anticus, and perhaps the supinator longus and supinator brevis. Anatomic and experimental investigation showed that the lesion was to be found in a certain circumscribed portion of the brachial plexus, at the point where the fifth and sixth cervical nerves make their exit from the scaleni muscles to unite and give origin to the supra-scapular nerve. The causes that have been present in the cases of this type of palsy hitherto reported are as follows: a fall upon the shoulder; excessive adduction of the arm; excessive abduction and elevation; crushing of the shoulder and traumatism; direct pressure; essential neuritis.

The second case was one of unusual birth-palsy. It occurred in a child that was delivered with the forceps after a difficult labor, the head presenting an obstruction to the delivery of the shoulders being encountered. On the

second day it was observed that the child failed to move the right arm, while it properly moved the right hand. The whole arm and particularly the hand was blue. There was slight movement at the shoulder from the action of the trapezius. The fingers were held in flexion; the arm in pronation. During flexion and extension of the hand, the arm remained at rest. There was apparently a palsy of the biceps, supinator longus, and deltoid, and perhaps also of the trapezius and pectoralis major. The deltoid and biceps were more relaxed and smaller in size than upon the opposite side. Movement of the arm or manipulation of the skin caused the child to cry. The application of the electrodes appeared to cause pain. The electric examination yielded unsatisfactory results. At a later date reactions of degeneration were found in the biceps, deltoid, and supinator longus. After long-continued electric treatment with the faradic current, almost perfect recovery ensued. It is inferred that the palsy in this case, which bears some similarity to the palsy described by Erb, is to be ascribed to pressure upon the brachial plexus during delivery.

HOCHSTETTER (*Berliner klinische Wochenschrift*, 1893, No. 42, p. 1016) has reported the case of a primipara, eighteen years old, with a generally contracted pelvis, in which exhaustion of the labor-pains and threatened death of the fœtus necessitated the high application of the forceps. After the birth of the somewhat asphyxiated child a depression made by the blade of the forceps was seen upon the right brow, and another at the anterior margin of the left trapezius muscle, a little above the clavicle. On the following day it was found that the left arm was palsied, the loss of power increasing for another day, but subsequently subsiding. The child appeared to have lost the power of abducting the arm. The forearm was held in a position of pronation, with the hand strongly flexed, the dorsum of the hand being swollen and the fingers generally flexed. The muscles of the arm, particularly those of the extensor aspect, were relaxed. Electric stimulation of the nerves with both primary and secondary currents failed to induce contraction, although the muscles responded to direct stimulation. There was neither fracture of bone nor epiphyseal separation, so that the condition was ascribed to compression of the brachial plexus by the forceps in the process of delivery.

EPILEPSY OF CARDIAC ORIGIN.

ROSIN (*Wiener medicin. Presse*, 1893, No. 43, p. 1677) reports a case of myocardial degeneration of arterio-sclerotic origin, in the course of which epileptiform convulsions appeared. He also refers to eleven cases of similar kind that he succeeded in collecting from the literature. In the case in question, a woman, who had previously enjoyed perfect health and was free from hereditary neuropathic predisposition and a history of alcoholism or syphilis, at the age of forty-nine years began to have attacks of tachycardia, without recognizable cardiac lesion. The paroxysms at first recurred every six or eight weeks, setting in suddenly and terminating as abruptly, and lasting for several hours. During the attack the face became pallid, and an abundance of limpid, almost colorless urine was passed. Subjectively there was a sense of cardiac tumult, together with a feeling of oppression and general distress. In the course of time the attacks increased in frequency, finally occurring

once a week, usually toward night, and lasting for three or four hours. After the lapse of some six years the attacks became still more frequent, and permanent arrhythmia manifested itself, with increase in the area of cardiac percussion dulness, an accentuation of the second aortic sound, and tortuosity and resistance of the peripheral vessels. It was now that the diagnosis of myocardial degeneration of arterio-sclerotic origin was ventured. Exertion was attended with shortness of breath and anginal symptoms. In the third year of this train of symptoms the woman was seized during sleep at night with an attack indistinguishable from an epileptic paroxysm, attended with incontinence of urine and followed by sopor and dulness. In the following ten years, up to the time of death, there occurred seven additional attacks of the same kind, all at night, in the midst of profound sleep. The last attack, the eighth, was the immediate cause of death. For the last five years of life five or six larval attacks occurred annually, preceded by an aura referred to the præcordium or epigastrium, and consisting in transitory nausea associated with great pallor and hallucinations. From a study of the case reported, and of the collected cases, it is concluded that disease of the heart and great vessels may constitute a cause of epileptic attacks. Such an etiology may be accepted in a given case if all other causes have been excluded. This variety of epilepsy may attend any form of cardiac disease, although myocardial degeneration and arterio-sclerosis are particularly prone to be active in this direction. The resulting condition depends upon a nutritive disturbance of the brain, in consequence of circulatory derangement, particularly in the motor area. There may, besides, be degenerative changes in the cerebral vessels. A special individual predisposition appears to be necessary for the development of this complication, as it is rather uncommon in connection with disease of the heart. Sleep seems to favor the occurrence of the paroxysms. Therapeutically, the remedies indicated are digitalis upon the one hand, and bromides upon the other.

EXOPHTHALMIC GOITRE FATAL IN THE COURSE OF FIFTEEN DAYS.

REYMOND (*Bull. de la Société Anatomique de Paris*, 5e sér., t. vii., No. 18, p. 456) has reported the case of a woman, forty-five years old, without neuropathic heredity, who had presented continuous tremor for more than a year, following emotional disturbance. Twelve days before coming under observation she was subjected to great agitation by reason of the dangerous illness of a daughter. Power was at once lost in the lower extremities, and the thyroid gland became enlarged, with progressive increase in size. The eyes were brilliant and presented a strange aspect, although they did not protrude. The cheeks were flushed and a constant tremor prevailed. Sensibility and motility were impaired in the lower extremities. An eruption of acne was present upon the back. The thyroid gland was notably enlarged. Upon auscultation, a systolic murmur was heard at the apex of the heart, notwithstanding the weakness of cardiac action. The patient vomited all that she took. Swallowing even of liquids was attended with much difficulty. The pulse was 125 in the minute. The temperature was 100.4° on the first day of observation, becoming, however, 102.2° a day later, and 104° at the time of death, on the third day. Upon post-mortem examination, the walls of the

left ventricle were found thickened, and the mitral valve incompetent, with its leaflets thickened and deformed. The thyroid gland was as large as an orange, its bloodvessels greatly distended. In the upper portion of the left lobe was seated a cyst, with hard and thickened walls and containing brownish fluid. Upon histological examination there appeared to be a hyperplasia of the epithelial cells of the thyroid gland, but without their characteristic follicular arrangement. The thymus gland was present. The peribronchial and peritracheal lymphatic glands were anthracotic, some hard, some soft. The cerebral vessels were also distended with blood. The ganglia of the cervical sympathetic presented no appreciable alteration.

THE ETIOLOGY OF LEUKÆMIA AND PSEUDO-LEUKÆMIA.

VERDELLI (*Centralbl. für die medicin. Wissensch.*, 1893, No. 32, p. 545) has reported two cases of pseudo-leukæmia and one case of leukæmia, in all of which, both by culture, from the lymphatic glands and from the blood, and in sections of various organs, he was able to demonstrate the presence of staphylococci pyogenes in pure culture (in the first case staphylococcus albus, in the second staphylococcus aureus, in the third staphylococcus aureus and albus). In the first, staphylococci were found in an axillary gland extirpated three and a half months before death; in cultures from the blood of the heart two hours after death; and some cultures prepared at the autopsy, from lymphatic glands, as well as in sections of these glands treated by Gram's method. In the second case, cultures from an inguinal lymphatic gland excised twenty-one days before death, yielded negative results, although staphylococci were found in sections of the gland, as well as in cultures prepared two hours after death from blood from the heart and from the femoral vein, and in various organs. In the third case, staphylococci were obtained six hours before death in pure culture from blood from one of the fingers, and immediately after death, from supra-clavicular, epitrochlear, and inguinal lymphatic glands, from the blood, and from the spleen. By introduction of these cultures into the peritoneal cavity and subcutaneous connective tissue, as well as by the introduction of bits of excised glands into the peritoneal cavity, the following results were obtained in rabbits: 1. Enlargement of lymphatic glands, spleen, and liver. 2. Round-celled infiltration, diffuse or circumscribed, resembling the appearance presented by lymphoma, especially perivascular, principally in lymphatic glands, spleen, liver, lungs, less commonly in the kidneys. 3. Slight thickening of the connective tissue of all the internal viscera. 4. More or less marked and extensive atrophic and necrotic processes involving the parenchymatous cells (of lymphatic glands, spleen, liver, and lungs, but especially liver and kidneys) in special relation with the inoculated infectious agent. 5. A slight but indubitable arteritis, particularly of the medium-sized and smaller vessels, of varying intensity in different organs, but always more pronounced in spleen and lungs. Variations in the histological changes were obtained by the repetition at intervals of several days of intense inoculations, the animals dying before sufficient time had elapsed for the changes described to have assumed a chronic character. All in all, these changes bore a close resemblance to those of leukæmia and pseudo-leukæmia. Investigation in one case into the urotoxic coefficients was not

conclusive, although it appeared that in frogs the respiratory and cardiac frequency were diminished, and that the irritability of the animals while slightly lessened immediately after the injection, increased considerably until opisthotonos, lasting for a short time, was developed; again diminishing as death was approached. From a comparison of the two cases of pseudo-leukæmia the inference is drawn that in this disease the degenerative and neoplastic processes may present great variations in the individual cases, and that the degenerative processes may preponderate to such a degree that the neoplastic changes are almost wanting, or *vice versa*; thus, two varieties of the disease may be distinguished anatomically, the first almost exclusively neoplastic, lymphomatous; the other degenerative in consequence of coagulation necrosis. The fact that the micrococci found in the blood and in the affected lymphatic system in all three of the cases were alike; further, the fact that in one case the organisms were found three and a half months before death; and finally, the fact that it was possible to induce in lower animals anatomic changes resembling those of leukæmia and pseudo-leukæmia, appear to Verdelli to afford strong confirmation of the view that there is a causal relation between the organisms and the disease. As suppuration was not observed in any of the cases, and only exceptionally in the experimental investigations, it is to be concluded that the virulence of the organisms was attenuated; the pallor of the colonies, their decolorization under certain conditions, likewise indicating a diminution of chromogenetic activity. The interpretation given these cases is in harmony with Virchow's view of their pathogenetic unity, although existing knowledge will not permit the final acceptance of such a view.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE
UNIVERSITY AND GERMAN HOSPITALS;

ASSISTED BY

ALFRED C. WOOD, M.D., AND C. L. LEONARD, M.D.,

INSTRUCTOR IN CLINICAL SURGERY, UNIVERSITY ASSISTANT INSTRUCTOR IN CLINICAL SUR-
OF PENNSYLVANIA; ASSISTANT SURGEON, GERY IN THE UNIVERSITY OF
UNIVERSITY HOSPITAL. PENNSYLVANIA.

WHITEHEAD'S OPERATION FOR HEMORRHOIDS FROM AN ANATOMICAL STANDPOINT.

AFTER a careful discussion of the blood-supply of the rectal region, THOMPSON (*Medical Chronicle*, August, 1893) observes that in all cases of piles that are advanced, three large pile masses come into view, especially after dilatation. The anterior mass, about half the size of the others, cor-

responds to the anterior radicles of the superior hemorrhoidal vessels, and their anastomoses with the middle hemorrhoidal and inferior vesical. The two postero-lateral masses correspond to the lateral trunks of the superior hemorrhoidal, and their anastomoses with the inferior hemorrhoidal. A proper understanding of these facts is necessary for the performance of Whitehead's operation. The anastomosis is complete; the veins have no valves; and, under ordinary circumstances, the greater part of the venous blood passes up the superior hemorrhoidal vein to the portal system, and thence through the liver. Any obstruction causes an excess of blood to flow into the middle and inferior hemorrhoidal vessels. This excess of pressure, with no adequate outlet, causes a distention in their weakest part, which is below, in the comparatively loose cellular layer, and not above, where they are supported by the dense submucous coat. The natural and inevitable consequence is chronic phlebitis, thrombosis, etc. The importance, however, of this loose connective tissue in which the pile area lies cannot be over-estimated, for in Whitehead's operation it enables the rectum to be safely separated from the surrounding tissues with but trifling hemorrhage and absolutely no damage to the sphincter muscle. Whitehead's operation this author describes as follows: The patient is prepared by enemas and antiseptic precautions and thoroughly anæsthetized; the sphincter thoroughly distended, with the patient in the lithotomy position, and forceps are placed on each of the pile masses. With a blunt-pointed pair of scissors the junction of skin with mucous membrane around the anal margin is carefully divided, a few snips bringing us into the cellular interval. By passing the finger into this space, either by itself or with the aid of the scissors, the mucous membrane is easily dissected up which contains the piles. This mucous area is drawn down by the attached forceps in the form of a tube; it is then slit up the side and partly around; this cut edge is then sewn to the skin margin by silk sutures; the circular cut is then continued and then sewn again, and thus, step by step, as it is cut the mucous membrane is sewn to the skin. Twisting or tying usually suffices for the slight bleeding encountered, but sometimes the modified Staffordshire knot of Dr. Sampson, placed in the supply of the pile area, will be of service. This can be done after the dissection of the mucous membrane. The author insists upon the importance of opening at the beginning of the operation the "peri-anal" space, and believes that failure to do so will cause later more or less injury to the sphincter and incontinence. He has the utmost confidence in this operation.

FOUR HUNDRED AND FIFTY CASES OF CONGENITAL CLUB-FOOT.

TAPPERT (*Münch. med. Woch.*, 1893, No. 18) has in the past forty years operated upon five hundred and forty cases of talipes. He has used the subcutaneous method for the most part, cutting the tendons of the shortened muscles, usually beginning with the tibialis anticus, which he has found to be shortened in all cases of intense talipes. Then after a few days the plantar aponeurosis and the tendo Achillis, in exceptional cases the extensor hallicis tendon, and through an open wound the tibialis posticus. Then follows a plaster-of-Paris bandage—a paper splint, the shape of the plantar surface of the foot and covered with plaster being first put on, and then the

bandage carried to the knee, paper being used here also to strengthen the splint. This bandage is renewed every eight days, this period being lengthened later, the correction being gradual meanwhile. In six to eight weeks, in children one to two years old, the foot regains its normal position, then beyond the normal in excess. A fixation-splint is then employed, and is to be worn day and night. It holds the foot in the correct position when at rest, but in standing and walking exaggerates the correction. If this treatment does not suffice in some cases, the *tibialis posticus* must be cut. In congenital cases the author operates in the seventh to the twelfth month, but uses stretching before this.

THE OPERATIVE TREATMENT OF HEMORRHOIDS.

THE papers recently published by Lang and Whitehead, in which they published simultaneously the results of an operation very similar in its character, which each, unknowingly, had performed, leads SENDLER (*Centralbl. für Chir.*, 1893, No. 34) to report the operation as he has performed it for some time past, with a *résumé* of some of his cases. He performs the operation as follows: After the usual preparations, the chloroformed patient is put into the lithotomy position, the pile is drawn down, a cut made in the skin opposite to the pile mass which is then dissected up from the loose cellular tissue; it is then cut free through sound mucous membrane, the sphincter being carefully avoided, and after hæmostasis the mucous membrane is united to the sound skin. If the pile is a large one, or there are many, it would be well to proceed, step by step, and after the extirpation of each pile immediately place the sutures. His after-treatment consists in the insertion of a drainage-tube covered with iodoform gauze and an antiseptic dressing; when, by means of a simple diet and opium, the bowels are confined for five or six days and then are only slightly moved. Generally after eight days the stitches can be removed and the patient can get up. His shortest cure was four days, the longest twenty-one days, or an average of fifteen days in bed. There was very slight pain after the operation and no untoward symptoms. He lost no patients. All of his cases had been under observation for some time, and in none does he find any difference from normal in the functions of the sphincter or rectum.

He claims for the operation speed and certainty, with no granulating surfaces of any moment, and a perfect functional recovery.

CALCULOUS PYELITIS WITH COMPLETE SUPPRESSION OF URINE FOR SEVEN DAYS; RELIEVED BY OPERATION.

AN interesting case of calculous pyelitis is reported by CABOT (*Boston Med. and Surg. Journ.*, August 31, 1893), in which the patient, a chronic sufferer from renal calculi, had anuria for seven days. The author, suspecting that the function of the right kidney had previously been destroyed and that the suppression in the other was due to reflex causes from a stone that obstructed the ureter, decided upon a median explorative laparotomy, with the chance of relieving the condition found present. The hand introduced found, as suspected, the right kidney enlarged, altered, and functionless, while no alteration could be felt in the left kidney nor the presence of a stone detected

either in the pelvis or ureter. An incision was then made in the left loin, and bimanual palpation used, but to no purpose. The wounds were closed and dressed, the patient made a good recovery from the ether, and about three hours later there was an escape of urine *per urethram*. The catheter drew off thirty-seven ounces, and in the first twenty-four hours there was passed, naturally and by catheter, two gallons. In the second twenty-four hours about five quarts passed. Then the amount gradually declined to about seventy ounces per diem. The conclusions which the author draws from this case are: "1. That in a calculous patient with a distinct attack of renal colic, the suppression of urine should be regarded as directly due to the stone, and that in the majority of cases both kidneys will be found to be disabled; for the cessation of the function of a healthy kidney, due to the irritation of a stone in the opposite ureter, must be very rare. 2. These cases should be treated by operation as soon as it is evident that the function of the kidney has come to a standstill, as there is little chance of the stone being pushed along the ureter when the kidney is no longer excreting urine behind it. 3. In the absence of any evidence as to the location of the calculus, the first step in such an operation should be a median laparotomy, with the hope of discovering the whereabouts of the calculus, in order to proceed intelligently for its removal. 4. If by this examination no calculus be found, so that further operative procedure cannot be decided upon, a steady massage of the pelves of the kidneys and of the ureters, from above downward, should be practised, in the hope of dislodging or breaking up a small calculus, if such exists." The patient's condition continued to improve after operation and a small amount of calculous material was afterward passed. Several subsequent attacks of a similar nature but not so severe were afterward recovered from, massage through the abdominal wall of the left ureter apparently assisting materially. Calculi were found after each of the subsequent attacks.

ANEURISM OF THE BRACHIO-CEPHALIC TRUNK AND THE ARCH OF THE AORTA TREATED BY LIGATION.

LE DENTU (*Bull. de l'Acad. de Méd.*, 1893, No. 8) gives an interesting case of aneurism treated by ligation after the method of Brasdor and Wardrop, with a concise *résumé* relative to their treatment. The diagnosis was made of an aneurism of the brachio-cephalic trunk about the size of a small orange. The pain and pressure symptoms became so great that it was decided to ligate the carotid and right subclavian. This operation was well borne and gave relief from pain on the right side, and also from the difficulty in breathing and the sense of oppression. The throbbing in the chest ceased slightly, but after three months became greater, and was then most noticeable in the left subclavicular region. A little over four months after the first operation he ligated the left subclavian artery. The result was good. The pain lessened, the pulsation of the aneurism grew less, and the patient could go about and attend to himself, until eight months later, when the pain again commenced, especially in the region of the right scapula; it was followed by symptoms of compression in the bronchi and larger veins, and three months later the patient died.

At the autopsy an aneurism of the aorta was found, beginning one and

three-quarters inches above the aortic valves, having transverse and vertical diameters of four and a half and four and three-quarters inches respectively. The innominate artery was included within the aneurism. There were no laminated clots found, while the ligated subclavian artery was entirely free. He believes this shows that, to produce clot-formation, the ligation must be very close to the sac. Instead of the left subclavian an enlarged artery had been tied. After a review of 261 cases, 135 of which he had had compiled lately, Le Dentu comes to the following conclusions concerning the treatment of aneurisms by the method of Brasdor and Wardrop: 1. In aneurisms of the brachio-cephalic trunk, the carotid and right subclavian should be ligated at the first sitting. If the aneurism continues to extend, without reaching the sixth vertebra, the right vertebral artery should be tied. If the tumor shows itself in the left supra-clavicular region the subclavian on that side should be ligated synchronously with the others; the left carotid should not, however, be ligated till some months after the right. 2. In primary or secondary aneurisms of the aorta, if in the ascending portion, ligate the brachio cephalic trunk as low down as possible. If the arch of the aorta is involved, ligate synchronously two large arteries, one on either side, but not the two carotids in the same sitting. All ligation is contra-indicated in aneurisms situated below the origin of the left subclavian. Internal treatment should in all cases be tried first, but operation with asepsis is much more favorable than were former operations.

THE TREATMENT OF FRACTURES OF THE LOWER EXTREMITIES.

WITHIN the past few years a marked change has been made in the treatment of fractures. This advanced method of treatment is remarkable for the saving of time to the patient, as well as strength, and also those evils which too often accompany long detention in bed, especially in patients of advanced years. Of this new method, SCHMID (*Centralbl. für Chirurg.*, 1893, No. 32) says the progress lies in the fact that, instead of spending six weeks in bed, the patient generally remains but six days, and avoids those complications, such as bronchial catarrh and hypostatic pneumonia; while healing is quicker, as he believes, because the circulation is nearer the normal, and the pressure of the parts together stimulates the healing process. For the past five or six years this author has used this method in treating all fractures of the lower extremities, and within the last two or three years in cases of compound fractures, resections, and osteotomies.

He claims for this method no improvement in technique; its results are due to a new method of using old and well-tried means. The author uses a well-fitting plaster-of-Paris bandage that does not include the joint (unless involved) on either side of the fracture; properly placed in apposition, the fragments can be securely held in place by this means. The patient is thus enabled in the first week to stand and move about without pain or danger. As an illustration the author gives his treatment of one case of fracture of the malleoli. When such a case is seen one or two hours after the accident, the bones should be set by extension, counter-extension, and manipulation, the limb placed upon a splint in an elevated position and cold applied. In from three to six days after resorption has taken place and the swelling has

gone down, a plaster-of-Paris bandage is applied from, in this case, the toes nearly to the knee-joint, forcible extension being maintained meanwhile. The patient can the next day, with such a dressing properly applied, stand and walk. If for any reason there is any doubt about the proper adjustment of the fragments, or if there are signs of swelling or of the disappearance of former swelling, the bandage should be reapplied after eight days. A sole and heel are placed upon the plaster, or in well-to-do patients a very high tight-lacing shoe made in three parts at the top may be used. He allows his patients two crutches for two days and two canes for two days more; then they go about with one, or generally without any. If the bandage is rightly put on, fear is the only thing that has to be contended with. One of his patients rode two weeks after fracture of the malleoli, and continued to ride for three weeks longer in his plaster-of-Paris dressing. Five weeks after such a fracture he removes the bandage and begins treatment by massage, baths, douches, and active and passive motion in the ankle-joint. The patient, however, is not allowed to walk until he has a strong, tight-fitting, high-laced shoe. By this method of treatment his patients have all done well, and he has never seen deformity or complications. There has sometimes been rigidity in the joints, but under the ordinary treatment it has always been easily overcome. When a fracture is seen immediately after the accident, and no swelling or ecchymosis has taken place, the plaster-of-Paris bandage may be applied immediately, and the entire healing allowed to take place under it.

THE TREATMENT OF SEVERE HARE-LIP.

SOME interesting points in the technique of plastic operations for severe cases of hare-lip are given by THOMAS (*Birmingham Med. Rev.*, Sept., 1893). Recognizing the fact that the cartilage which normally forms the floor of the nasal canal, is found in the side of the cleft corresponding to the ala of the nose on the same side, and is continuous with it, this author inserts the point of his scalpel, blade downward, at a point below and outside of the inferior curvature of this cartilage, and then cuts a flap which includes its lower extremity. This he turns upward and inward, and then makes two corresponding raw surfaces, one on the outer side of the base of the column, the other below and continuous with it; he then applies and sutures together the corresponding surfaces. This converts a severe case into a simple one, which is followed, at a second sitting, by the ordinary operation for hare-lip.

THE CONSERVATIVE TREATMENT OF HEMORRHOIDS.

P. RECLUS (*Gaz. des Hôpitaux*, 1893, No. 35) treats painful hemorrhoids by sitz baths and washings with water at a temperature of about 120°-130°, and believes that their worth is far greater than that of cold baths. Before and after defecation the patient should insert into the anus cotton tampons soaked in a 2 per cent. cocaine solution. As the first operative procedure he recommends dilatation, but not the digital, but by means of Trélat's two-bladed speculum. General narcosis is unnecessary. A tampon soaked in a 2 per cent. cocaine solution is placed in the ampulla recti for three or four minutes; then he injects into the sphincter ani itself in different places 1

hypodermic syringeful, 3j, of a one per cent. cocaine solution, which produces full anæsthesia in a few minutes. The speculum is then introduced and opened to the maximum. The author has used this method in sixty cases, with but one troublesome case. All the other cases were permanently cured. Incontinence never followed, and in only one case was there relapse. In such cases an operation is the only recourse, either with the knife or scissors. This can be accomplished with local anæsthesia from cocaine. The author had operated with success in thirty cases in this manner, and in only one was there complication, a secondary hemorrhage, which was easily controlled by a deep stitch. He believes that the extirpation should be the last resort, and that the other methods should be used in the order described.

THE TREATMENT OF PERFORATED GASTRIC ULCER.

BARLING (*Birmingham Med. Review*, Sept., 1893) reports three cases of perforation and peritonitis from gastric ulcer. The first case was latent; there was perforation, acute peritonitis, abdominal section, and drainage, followed in twenty-four hours by death. The autopsy showed a circular perforation one inch in diameter, situated on the anterior wall of the stomach. The second case was accompanied by acute peritonitis; the perforation was found and sutured, the cavity drained, but the patient died thirty hours after operation. The autopsy showed peritonitis, with a purulent thin fluid in the peritoneal cavity. The perforation was on the anterior surface of the stomach; it was closed by the sutures, and adhesion had taken place between the opposed peritoneal surfaces. In the third case, operation was delayed until three weeks after the first acute symptoms; these had subsided after medical treatment, but became exacerbated, through recourse to feeding by the mouth, the rectum having become irritated. The symptoms were pain in the left hypochondrium and lumbar regions; there was also present tenderness and impaired resonance. It was decided to open the abdomen, and drain this supposed abscess due to leakage from a gastric perforation.

The operation was successful, and the patient, though in a very weak and collapsed condition at the time of operation, continued to improve, and recovered entirely. The author believes that these cases show that operative interference is needed in such cases; the mortality is so great in all cases of perforation that he feels that any chance can be justifiably taken, and patients saved may be considered as saved from almost certain death. He says their best chance lies in early diagnosis and early operation. This should consist of laparotomy, the line of incision being the median above the umbilicus; suture by Lambert's method, if possible; and thorough drainage both from the seat of perforation and from the bottom of the pelvic cavity; with restricted rectal feeding and opiates.

TWO CASES OF CONGENITAL FISTULÆ IN THE NECK.

THE supposedly rare occurrence of these fistulæ leads SCHLANGE (*Arch. für klin. Chirurg.*, 1893, Band xlv., Heft 2), to report two interesting cases, one of lateral and the other of median fistula of the neck. The external opening of the lateral fistula lay in the lower third of the neck between the

trachea and the sterno-cleido-mastoid muscle; the internal opening was in the neighborhood of the tonsil. Its removal was easy and the healing prompt. The histological characteristics were noteworthy: a cylindrical epithelium upon a lymphadenoid basement structure surrounded by longitudinal muscular fibres; and in the lymphadenoid tissue were glands similar to those in the intestinal mucous membrane. The second case is one of median fistula. These, as a rule, are more difficult to cure; their course is toward the hyoid bone, where they appear to mingle with and terminate in the periosteum. This, however, is not the case; they either pass around or through the bone and terminate in the mouth. This was the case as reported. Following up the fistulous tract, the author came upon a tumor, closely adherent and joined to the periosteum of the hyoid, about the size of a cherry. He resected the bone and found closely united to the other side another tumor similar in size, and extending from this a fistula emptying into the pharynx at the base of the tongue. The tumors had the appearance of fibromata, and on microscopical examination were found to be fibrous in structure, hollow, and lined with a pavement epithelium. The author believes that the resection of the hyoid bone does no harm—he has seen none; and that this radical form of treatment is the only one for this class of fistulæ.

THE OPERATIVE-TREATMENT OF FLAT-FOOT.

GLEICH (*Arch. für klin. Chirurg.*, 1893, Band xli., Heft 2) bases his procedure on pathological and anatomical grounds in the treatment of this annoying condition. In all other methods he has seen relapse and the recurrence of all symptoms. For the permanent correction there must be a greater angle between the axis of the calcaneus and the plantar surface of the foot than in this condition where it is all but obliterated. To produce this result the author operates as follows: An incision is made similar to that for Pirogoff's amputation, followed by a tenotomy of the tendo Achillis. From the calcaneus is then resected, in a diagonal plane from above downward and behind forward, a wedge having its base downward and measuring about half an inch in its thickest part. If the remaining cut surfaces of the calcaneus are now applied to each other, it will be seen that the angle has been decreased between the axis of the bone and the plantar plane, and that the foot has been raised about three-eighths of an inch.

THE RESECTION OF THE KIDNEY.

AN interesting article is added to the study of kidney operations by the experimental operations in nephrectomy and the reporting of three successful cases as described by KÜMMELL (*Arch. für klin. Chirurg.*, 1893, Band xli., Heft 2). A long series of experiments which this author conducted, together with those already reported by other experimenters, led him to conclude that it is possible to excise large portions of the kidney without interfering in any way with its function, and that it is not necessary, in partial change or disease of this organ, to remove it entirely, but that it may be resected with good results. He reports three of his own cases, and after a *résumé* of cases extant in literature, concludes that we may say of the human kidney

that partial nephrectomy is possible; and not only that, but that nephrectomy of the one kidney and partial nephrectomy of its fellow are possible without destroying the function. It is never possible to say that only one kidney is diseased, and it is better to remove only the diseased portion of one rather than the entire organ, and perchance leave the entire function to the performance of a diseased and weakened fellow.

In none of the operations reported was there any extravasation of urine through the wound, or was there any urinary fistula created. This was probably due to the fact that the pelvis of the kidney was not opened. The wounding of the pelvis should always be avoided, as it tends to extravasation and creation of fistula, which must finally result in nephrectomy. If it be necessary to enter this cavity it should be done through the kidney substance. Hemorrhage during these operations may be severe. It can usually be checked during the operation by pressure upon the kidney itself. If this, however, does not suffice, a deep stitch, unless it cuts through, will check it. If it does not, the kidney should be sewed into the wound and packed with iodoform gauze. The incision in the kidney should, when possible, be wedge-shaped and transverse rather than longitudinal. When possible the direction of the vessels should be taken into consideration. A partial nephrectomy rather than nephrectomy is indicated in lesions from benign tumors and those that are localized, while he especially recommends it in all pyonephritic processes where the removal of the diseased portions leaves the kidney in a condition easily recovered from. In some cases this is not possible and nephrectomy becomes a necessity, while in others the parenchymatous inflammation has produced such adhesions that a partial nephrectomy is easier and more serviceable than a total one.

THE TREATMENT OF BURNS.

FAYTT (*Gazeta Lekarska*, 1893, No. 6; *Centralbl. für Chir.*, 1893, No. 36) recommends the use of dressings wet in aqua Goulardi, sublimate, or solutions of salicylic acid, until the epidermis or the necrotic tissue is removed. As soon as the wound begins to granulate he covers it entirely with silk protective; the pieces must not either project over the edge of the wound or lap over each other. Over all is then placed an ordinary antiseptic dressing. His theory for the results obtained by this dressing is, that the secretions pass easily along the silk to the edge of the wound and are quickly absorbed by the dressing, which does not lie upon the wound surface, and can accordingly be left undisturbed for longer periods. The pain and tendency to contracture of the scar, he claims, are minimized by this method.

THE PATHOGENESIS OF DEATH FROM BURNS.

KOCH (*Wiener med. Wochenschr.*, 1893, No. 17) in a series of researches on 32 cases of severe burns, of which 16 patients died, confirms the already reported observation of Tappeiner, that there is a loss of blood plasma. This author found in the cases of death that the specific gravity was between 1065 and 1076, and he concludes from this that in contradistinction to the normal, the blood in cases of severe burns easily loses its plasma. This loss is not a true decrease of plasma, but is caused by the change in the red blood-cor-

puscles and the toxic substances arising therefrom. This change is not seen or does not arise in the neighborhood of the scab, but at the point where the blood, warmed to from 40°-60° C., becomes functionless. He believes it is worth while to use intravenous injections of normal salt solution in these cases.

THE BROMIDE OF ETHYL AS A GENERAL ANÆSTHETIC.

IN an interesting historical and physiological discussion of this subject, with the report of about 500 cases in which it was employed, either alone or combined with chloroform, HARTMANN and BOURBON (*Rev. de Chir.*, Sept., 1893, No. 9) come to the following conclusions: It is of the greatest importance that a pure bromide of ethyl be employed; especial care should be taken that the bromide of ethylene is not substituted by mistake for it. This has caused accidents that have been attributed to the bromide of ethyl, and is dangerous for the patient. The bromide of ethyl, employed as it should be, is a most convenient, most rapid, and the least dangerous anæsthetic. The recovery is prompt and is not followed by malaise. It produces a congestion of the cerebrum, and consequently can be administered in a sitting position, and is thus employed by laryngologists. It is, however, harmless only in short operations, and can therefore only be used in such. For longer operations it is necessary to resort to mixed narcosis, the bromide of ethyl being used at first, and then chloroform; this shortens the first stage, but does not exclude the danger of syncope. It has the disadvantage in some cases of making the patient's breath smell for a day or two of garlic, but of this he is not conscious.

HERNIA IN THE OBTURATOR FORAMEN.

A CASE of complete incarcerated obturator hernia containing the tubes and ovaries is reported by v. ROGUER-GUSENTHAL (*Wiener med. Presse*, June, 1893, No. 26) as follows: This is the fourth case reported in which the female generative organs have formed a part of the hernial contents. The slow formation of the hernia and the deepening of the obturator foramen are characteristic. The predisposing cause was a fall twenty-six years previously; the exciting cause was the patient's age and the relaxation due to loss of fat. The prolonged symptoms of the incarceration are of interest, and show that there was a constant tendency toward strangulation. The tumor was not clearly seen until the time of operation. It was soft, elastic, and fluctuating, and lay further inward and below than a crural hernia. The tumor was sensitive to pressure. There was but slight swelling of the abdomen, and no fever. The intestine was in the foramen, and became rapidly gangrenous. The laparotomy would, if the patient's condition had been better, have produced better results. It was, however, attended with many difficulties, but the Trendelenburg position aided in a marked degree. This allowed the examination of the obturator foramen, but in the case of such a gangrenous hernia the formation of an anus præternaturalis would probably yield better chances.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OFJ. SOLIS-COHEN, M.D.,
OF PHILADELPHIA.

RESECTION OF THE NOSE FOR REMOVAL OF POLYPI.

DR. ALBERT PANNÉ, of Nevers, reports (*Archives Internat. de Laryngologie, etc.*, 1893, t. vi. No. 4) an instance in which he found it necessary to make a resection of the nose and keep the parts temporarily ununited for three months in order to relieve a patient from mucous nasal polypi.

A young man, nineteen years of age, began at fifteen to have temporary difficulty in respiration and repeated coryzas, being compelled to breathe through the mouth at night, and eventually day and night. Within two years his nose became deformed, enlarged, and flattened. At the end of the third year he consulted a physician, who detected numerous polypi, numbers of which, or fragments of which, he extracted with forceps once a week during four months. Post-operative hemorrhages were profuse and debilitating; and the nose remained obstructed while the deformity increased, so that finally both patient and physician ceased their efforts for relief. Several months latter he consulted Dr. Panné, who removed many enormous polypi and fragments of polypi with forceps for three weeks without material benefit; the patient becoming so discouraged as to threaten to commit suicide. A radical operation was then attempted. The nose was separated from the face on the left side and thrown over the right cheek. Numerous polypi were extracted with forceps, and the parts were then curetted and cauterized with thermic and electric cauteries. The parts were replaced, but prevented from reuniting by the intervention of strips of gauze between the raw surfaces. Four subsequent operations by curetting and cauterization were necessary at intervals of a few days before the nasal fossæ were sufficiently free to justify definitive suturing of the nose into position, which was done on the twenty-first day after the resection. Three months later there had been no evidence of recurrence, so that the hope was entertained that all danger of recurrence had passed.

SUPPURATION IN THE FRONTAL SINUS.

DR. LUC reports (*Archives Internat. de Laryngologie*, 1893, t. vi. No. 4) a case of latent empyema of the right frontal sinus of a lady, fifty-four years of age, in which the cause was not apparent, and in which incomplete cure followed trephining the frontal sinus and curetting the suppurating surfaces. The suppuration, of six years' duration, and said to have immediately followed a coryza from cold, had been incorrectly referred to the maxillary sinus, which had been opened to no purpose after sacrifice of a second molar tooth.

After some months of ineffective topical treatment in the nose, it was determined to trephine the frontal sinus, although there was no direct symptom of its implication. In fact, the only symptoms of disease, other than the presence of the pus in the nasal passage, were loss of appetite for solid food in consequence of a slight septic influence, and a veiled appearance of objects when viewed solely by the eye on the affected side. As soon as the sinus was opened there was escape of pus mixed with blood. Curettage was performed, and drainage established by the introduction of a perforated rubber tube, the two extremities of which, one protruding from the nose and the other from the wound, were attached together with a thread. The drain was withdrawn at the end of three weeks, and the wound became closed over night. The ocular troubles disappeared almost completely, and the appetite became restored, but there remained some discharge necessitating daily anti-septic douching.

ANATOMY OF THE NASAL SEPTUM.

DR. PAUL RAUGE describes (*Archives Internat. de Laryngologie, etc.*, 1893, t. vi., No. 4) the macroscopic anatomy of Jacobson's organ in the ox and the sheep. It is rudimentary and often difficult to detect in man, but comparative anatomy throws some little light upon its structure and function.

SCALDS OF THE THROAT AND LARYNX IN CHILDREN.

IN the first portion of an address on "The Surgery of the Air-passages and Thorax in Children," delivered at the Royal College of Surgeons of England (*The Lancet*, 1893, vol. ii., No. 11), MR. BERNARD PITTS first discusses the two chief clinical features of scalds of the throat and larynx—namely, causation and treatment.

Of 78 cases admitted to St. Thomas's Hospital (1872-1893) the average age was a fraction over three years. The cause in 67 of them was inhaling steam, or attempting to drink boiling water from the spout of a kettle; in 4, "drinking from teapot spout;" in 1 each, "drinking hot cocoa," "hot potato in mouth," "hot tallow," and "pepper forced into the throat"—the latter, as remarked, not strictly a scald; while in 3 cases the cause was not stated.

There were 15 deaths, in 12 of which tracheotomy had been performed, intubation having been performed first in 3 of them; 8 cases recovered after tracheotomy, and 3 after intubation, neither of which operations was performed in cases that did not seem likely to prove fatal. Only one case recovered after intubation followed by tracheotomy.

Brief records are given of 12 cases which died after tracheotomy, of 8 cases which recovered after tracheotomy, and of 3 cases which recovered after intubation.

Mr. Pitts refers to some cases at the Wolverhampton General Hospital.

In view of recent reintroductions of practice it is interesting to note a reference by Mr. Pitts to a paper read before the Royal Medical and Chirurgical Society by Dr. Marshall Hall, on April 3, 1821, in which that gentleman regrets that he did not scarify the epiglottis and glottis in his cases, and concludes thus: "I have also conjectured that it might be possible to relieve

symptoms by introducing a tube into the larynx, an expedient peculiarly adapted to a case which time would cure, and in which the cause of irritation would not be materially aggravated."

GUNSHOT WOUND OF THE LARYNX.

THE case is reported by DR. A. SOKOLOWSKI, of Warsaw (*Archives Internat. de Laryngologie, etc.*, 1893, t. vi. No. 4). A man, forty-seven years of age, was shot in the left cervical region from a distance of some fifteen paces. There was at once violent cough and expectoration of considerable sanguinolent mucus. Deglutition was almost impossible, and there was a distinct sensation indicative of lodgment of the ball in the larynx. The voice became husky, and this huskiness increased to complete aphonia in a few hours. On his arrival at the hospital Dr. Kijewski noticed a small wound over the central portion of the left wing of the thyroid cartilage, the skin around being bruised and discolored by the powder. The left side of the larynx and of the corresponding cervical region were tumefied. Aërial crepitation was noted on palpation at the anterior and lateral portion of the neck and below the clavicle. Respiration was free. A few hours later the patient ejected the missile in a violent paroxysm of cough. It was a revolver ball $1\frac{1}{2}$ centimetres in length and 5 millimetres in diameter. Deglutition immediately became much easier, but the hoarseness remained.

Sokolowski saw the case three days later, the patient being still very hoarse. The left arytenoid, the left aryepiglottic ligament, and nearly the whole posterior wall of the larynx were tumefied, red, and the vocal band was absolutely immobile on inspiration. The left ventricular band was congested and thickened, as was the corresponding vocal band, which at the anterior and inferior portion of its free border exhibited an exulceration 2-3 mm. in length and 1 mm. in diameter, covered with a whitish pellicle. The right side of the larynx and the epiglottis were normal.

The ball had, therefore, transversed the larynx and had remained imbedded in the soft tissues for a few hours. Recovery was prompt and satisfactory.

TRACTION OF THE TONGUE AS A CURATIVE AGENT IN NERVOUS APHONIA.

DR. C. M. DESVERNINE, of Havana, in an article (*Annales des Maladies de l'Oreille, du Larynx, etc.*, 1893, t. xix., No. 8) on the influence of lingual traction in certain cases of nervous aphonia, reviews the psychical treatment and gymnastic training employed in this affection, which is largely hysterical in character, whether in males or in females, and reports two recent instances of the utility of such traction in his own practice.

He contends that the distention of the lingual muscles does not act psychically but physiologically, exciting the central nuclei which preside over phonation, and which are probably in a state of dynamic incapacity from which they are aroused by double influence—encephalic and peripheric.

OPHTHALMOLOGY.

 UNDER THE CHARGE OF

GEORGE A. BERRY, M.B., F.R.C.S. EDIN.,

OPHTHALMIC SURGEON, EDINBURGH ROYAL INFIRMARY;

AND

EDWARD JACKSON, A.M., M.D.,

PROFESSOR OF DISEASES OF THE EYE IN THE PHILADELPHIA POLYCLINIC; SURGEON TO
WILLS EYE HOSPITAL, ETC.

 A NEW METHOD OF CANTHOPLASTY.

To avoid the danger of reunion of the divided lids after this operation, KENNETH SCOTT (*Ophthalmic Review*, vol. xii., No. 144), after dividing the canthus in the usual way, introduces a spring speculum and dissects up the portion of the conjunctiva opposite the centre of the wound from its attachment over the globe, almost as far as the corneal margin. The free edge of the conjunctival flap is then attached by a fine silk suture in the usual manner to the apex of the skin wound, when it will be found that there is no tendency toward dragging. The speculum is then removed and the conjunctival edge sewn in turn to the opposing cut margins of the upper and lower lids.

A silver wire suture, which has been thoroughly softened in the flame of a spirit lamp, is then passed right through the substance of the upper lid from the skin to its conjunctival surface near to its ciliary margin and a short distance from the cut surface of the canthus. It is fastened by twisting lightly so as to avoid constricting the tissues. The needle end of the suture is then passed through the substance of the eyebrow directly over the outer third of the lid, and is fastened by twisting to the other free end brought up to meet it. The lower palpebral part of this strand of silver wire is then curved outward so as to evert the outer end of the new lid margin and prevent all possibility of its approximating the opposing cut edge of the lower eyelid.

The operation is done with antiseptic precautions under cocaine, except in the cases of children, when a general anæsthetic is usually required. The suture should not be removed until the wound between the skin and conjunctiva is quite healed, usually about the fourth day.

 CALOMEL CONJUNCTIVITIS.

DRS. HARRY FRIEDENWALD and A. C. CRAWFORD (*American Journal of Ophthalmology*, vol. x., No. 8) report three cases of this affection, with observations on an inflammation identical with it in character, produced experimentally upon rabbits. The symptoms consist of œdema of the lids and conjunctiva, injection of the vessels, profuse lacrymation, mucous or even purulent discharge, and the frequent formation of a diphtheritic membrane. The inflammation differs from the ordinary acute conjunctivitis in being

sharply limited to one part of the membrane, usually the lower part of the ocular conjunctiva and that lining the lower lid. The cornea is not involved, unless the inflammation be very intense.

The affection is produced by the placing of calomel or of other mercurous compounds in the conjunctiva, while potassium iodide is being taken internally in sufficient quantity to be eliminated by the tears. It is not necessary that the iodide should be taken by the mouth, since the same effect has been produced where it was used by inunction or administered hypodermatically. Other preparations containing iodine in sufficient quantity will produce a similar effect.

It has been demonstrated that calomel in the presence of the animal fluids containing sodium chloride is very slowly changed into the bichloride and free mercury. It has also been demonstrated that potassium iodide is excreted in the tears, though not so freely as by the urine and saliva.

In a solution containing potassium iodide, both the chlorides of mercury undergo decomposition, forming compounds which act upon the conjunctiva as caustics.

The discoloration due to decomposition of the flakes of calomel in the conjunctival sac preceding the onset of inflammatory symptoms is noted in the experiments made on a rabbit, and has also been observed in the human eye by other observers. After the use of five-drachm doses of potassium iodide twice daily, it can constantly be detected in the tears by the chloride test; but a very much smaller quantity may give rise to conjunctivitis, irritation being caused by the insufflation of calomel twenty hours after the use of the iodide in half-drachm doses. The use of bromides will produce a similar effect.

EYE SYMPTOMS OF CEREBRO-SPINAL MENINGITIS.

DR. R. L. RANDOLPH (*Bulletin of the Johns Hopkins Hospital*, vol. iv., No. 32) reports upon a clinical study of forty cases of cerebro-spinal meningitis with reference to the eye symptoms. Probably every case of this disease shows some involvement of the eye. Conjunctivitis and photophobia; contracted, dilated, or unequal pupils; strabismus; pus in the anterior chamber, and keratitis are common. Sometimes suppurative chorioiditis and pan-ophthalmitis occur. In the epidemic in question as studied by Randolph, the principal lesions were only revealed upon ophthalmoscopic examination. In six cases there was optic neuritis, in one retinitis, in another thrombosis of the central vein of the retina, and in nineteen cases there was great engorgement and tortuosity of the retinal veins, which were also very dark in color.

In some of the cases that exhibited no lesions of the fundus of the eye, it was probable that such lesions appeared at a later stage of the disease. Of three cases, which when examined, presented no eye symptoms, two recovered, and in the other lesions probably developed later. In eight cases there was strabismus, all divergent; and in all cases it was the right eye which diverged. In several other cases the right eye seemed to be most severely affected. No explanation to account for this greater liability to disease of the right eye is offered, although the fact has been noted by other observers.

It would seem that all epidemics of cerebro-spinal meningitis have one or

more eye symptoms in common, conjunctivitis and pupillary changes being most frequently met with; but in every considerable epidemic there is apt to appear a special type of the eye affections. Thus, certain observers have noticed suppurative inflammation of the uveal tract; others have seen keratitis; still others only conjunctivitis; while in this epidemic the lesions of the retina and nerve predominated. The latter lesions have probably the most important significance as bearing upon the prognosis, which becomes unfavorable in proportion as they appear early and are strongly pronounced.

It is clear that in all epidemics of cerebro-spinal meningitis a systematic examination of the eyes should be made with the ophthalmoscope. The existence of good vision does not mean a sound optic nerve or retina. Frequently with a high grade of neuritis the visual disturbances are insignificant. It is surprising to what a stage disease of the chorioid, retina, or optic nerve can advance without causing any subjective symptoms whatever, or any symptoms of which the patient will be conscious in the presence of the great physical suffering of this disease. Of the thirty-six cases Randolph examined ophthalmoscopically but three complained of their inability to see distinctly.

Where death does not ensue, optic neuritis is apt to be followed by atrophy and blindness that is usually permanent, although in one case he had seen it was stated that the subsequent recovery was complete.

OBSTETRICS.

UNDER THE CHARGE OF

EDWARD P. DAVIS, A.M., M.D.,

PROFESSOR OF OBSTETRICS AND DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC;

CLINICAL PROFESSOR OF DISEASES OF CHILDREN IN THE WOMAN'S MEDICAL COLLEGE;

CLINICAL LECTURER ON OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE;

VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.;

ASSISTED BY

WILLIAM H. WELLS, M.D.,

ASSISTANT DEMONSTRATOR OF CLINICAL OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE.

PHILADELPHIA; CLINICAL ASSISTANT TO THE CHAIR OF OBSTETRICS AND

DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC.

A CASE OF THE PORRO OPERATION WITH A NEW AFTER-TREATMENT.

SEELIGMANN (*Centralblatt für Gynäk.*, 1893, No. 28) reports a case in which Porro's operation was done upon a patient with osteomalacia. He performed Cæsarean section for the delivery of the child, which was then in the thirty-fourth week of gestation, at the same time removing the uterus and ovaries, with success for mother and child. Five days later he began his new after-treatment. The pelvis was much deformed; the pubic arch was compressed and twisted; the promontory of the sacrum far advanced into the pelvis; symphysis beak-shaped; conj. diam., 8 cm. There was a history of tuberculosis on the maternal side of the patient's family. The apparatus used in the after-treatment was one of extension and counter-extension, known as

Volkmann's sleigh-harness apparatus. The weights were used after the apparatus had been on eight weeks, no pain being caused by them or by the forcible extension. Measurements taken before the apparatus was applied were as follows:

Total length, from head to the soles of the feet	. . .	125 cm.
From left trochanter to skull	. . . . .	36 "
" right " " " " " "	. . . . .	36 "
" left " " foot sole	. . . . .	89 "
" right " " " " " "	. . . . .	84 "
Weights applied to the left under extremity	. . . . .	9½ lbs.
" " " " right " " "	. . . . .	11½ "
" " under arms	. . . . .	11½ "

After the weights were on, a measurement showed that the woman had gained 18 cm. in length, and the two lower extremities were equally long. The swelling of the joints had disappeared. The patient was allowed to stand, and little shortening was observed. The pelvic deformity lessened, and the kypho-scoliosis largely disappeared, so that now after seven years of helplessness and great pain the patient is restored to health and comfort.

LYSOL AS AN ANTISEPTIC AGENT IN OBSTETRIC PRACTICE.

ROSSA (*Wiener klinische Wochenschrift*, 1893, No. 24) records the results after six months' use of lysol as an antiseptic agent, in the clinic of Rokitansky. Lysol is an antiseptic agent of great power, and with water, in the strength of 1 per cent. and upward, forms a milky fluid of a tar-like odor. It will not, except in very strong solutions, affect the hands, like carbolic acid or sublimate solution, the latter, as is known, often producing severe eczema. It is also freely soluble in water, in which it has the advantage of carbolic acid; in its solubility the danger of toxic effects is decreased. In solutions of the strength of 1 per cent. it forms a valuable disinfectant for instruments, the external genitals, and the hands, on the latter producing much the same soap-like feeling that creolin does. For vaginal injections he generally uses it in the strength of 2 per cent. Under the strength of 1 per cent. it quickly becomes useless as a disinfecting agent. Rubber drainage-tubes and catheters should not be left too long in solutions of lysol, as they become roughened by contact with it. In gynecological practice the results of its use have been good; but in applications within the bladder, even in as weak solution as $\frac{1}{2}$ of 1 per cent., lysol has produced cystitis.

Lysol, however, is not without toxic effects, as has been shown by Remou-champs, Sugg, and Gulach, and several cases of poisoning from it are recorded. The writer closes his interesting article by a number of statistics showing a decreased death-rate, and an increase in the number of cases free from fever, following the use of lysol.

RUPTURE OF THE VAGINAL ARCH DURING LABOR.

SCHICK (*Prager medicinische Wochenschrift*, 1893, No. 29, p. 355) reports the case of a laboring woman, aged thirty-six, a II-para, who gave a history

of perforation of the foetal skull and forceps delivery in her first labor. The patient was of slight build, with some osseous deformity and an overhanging abdomen. Pelvic measurements: Crests 27 cm., sp. il. 24 cm., troch. 29 cm., diam. Baud. 17.5 cm., conj. diag. 11 cm. The head was in the first position, vagina wide and smooth, os contracted, bladder distended. During several hours the head remained stationary; at the end of this time forceps was applied, and the head delivered after several strong tractions. Uterus did not remain contracted until some time after delivery. As the placenta did not appear and the patient seemed much prostrated, a hand, guided by the cord, was passed into the vagina. It was found on examination that a large rent opening into the abdominal cavity existed in the upper anterior vaginal wall, and through this tear the placenta had disappeared. Laparotomy was performed as collapse seemed imminent, and supra-vaginal amputation of the uterus done. The abdominal cavity was found full of clots and fluid blood. The uterine stump was treated with a cautery and was secured by two needles. Silk sutures were used. The patient finally recovered.

DERMOID CYST OF THE OVARY AS A HINDRANCE TO BIRTH.

FISCHER (*Prager med. Wochenschr.*, 1893, p. 285) reports the case of a woman, aged thirty-seven, a IV-para, in whom a tumor of a long oval shape, two fingers' breadth below the xiphoid cartilage, was found. Patient was in labor at the time of observation. It was noticed that under uterine contractions the lower uterine segment was tense, and the contraction ring on a level with the umbilicus. External genital organs and pelvic diameters were normal in every way. The retro-vaginal arch was thrown forward by a round, smooth, elastic tumor; fluctuation indistinct. The os was high up and in a state of contraction; bladder much distended. No foetal heart-sounds could be made out. The tumor was punctured with a Pravaz syringe, bringing away a curdy fluid and hair. Cæsarean section was then performed with good result. Discharged on tenth day cured. Two months later the patient again presented herself, giving an account of much pain in the lower abdomen, with swelling. Examination revealed a much-enlarged uterus, fixed by adhesions, and from its right side a tumor as large as a child's head extending from the vagina to the kidney and colon. This tumor appeared firmly adherent.

The abdomen was opened, and a large, generally adherent pus cavity containing hair was found. The uterus was firmly adherent. The patient made a good recovery, except that a long sinus extending to the kidney required further treatment, which, however, was successful.

COMPLETE INVERSION OF THE UTERUS.

PÉRAIRE (*Annales de Gynécol. et Obstétr.*, 1893, tome xl. p. 94) reports a case of complete inversion of the uterus, with prolapse, consecutive to delivery. The inversion was immediately followed by dangerous hemorrhage. Patient was in a state of extreme collapse. Reduction was effected by means of taxis, preceded and followed by the most rigorous antiseptic precautions. The labor had been quite normal until the placenta and uterus were extruded together. The patient finally recovered.

A CASE OF CONSERVATIVE CÆSAREAN OPERATION.

DOKTOR (*Centralblatt für Gynäk.*, 1893, No. 27) reports an interesting case in which the Cæsarean operation was done on a primipara, thirty-two years old, of undeveloped appearance. The height of the patient was 132 cm., her deformity consisting in an angular lumbo-sacral kyphosis at the fifth lumbar vertebra. Sacrum convex posteriorly. The transverse outlet was also much narrowed, two fingers being unable to find entrance between the ischia. The abdomen was opened when labor began. The uterus was brought out through the abdominal wound, an assistant grasping the uterine neck so as to compress it and hold it upright. The incision was made from the fundus to the neck, through the placenta, and the child quickly extracted. Severe hemorrhage was encountered from the placental site. The uterus was closed by silk sutures passed through its entire thickness about $\frac{3}{4}$ cm. apart, the abdominal sutures being of silkworm-gut. The strictest asepsis was maintained. Before the operation two injections of ergotine were employed, yet even with this and the manipulations, no active contraction of the uterus was observed; the retraction, however, was satisfactory, and the volume reduced to that of a recently delivered uterus. The total hemorrhage was not more than is found in the ordinary labor.

Recovery was prompt; little lochial discharge was present. The writer draws attention to the following points:

1. The operation was done at a most convenient time.
 2. To arrest bleeding no elastic band was used, and no compression with the fingers.
 3. The wound was closed with the simplest sutures. The arrest of hemorrhage must have been from uterine contraction.
 4. Absolute asepsis.
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A METHOD OF REDUCTION OF THE COMPLETELY RETROVERTED GRAVID UTERUS BY THE APPLICATION OF A PESSARY.

LEVRAT (*Le Mercredi Médical*, No. 30, 1893) describes a method for the replacement of the gravid uterus by manual means, the operation being that used for several years by Laroyenne. The manipulation consists in passing the hand between the uterus and promontory, avoiding all pressure upon the former, this being most easily done by following the lateral wall of the pelvis to the sacro-vertebral angle. When the hand has arrived here, the uterus is generally found partially enucleated from the promontory, but often the reduction is incomplete. The first stage having been successfully accomplished, the second consists in placing in position an appropriate pessary. This should have the form of a Hodge ring, with the posterior arc very large and of such a shape as not to press on any one point of the uterus. The arc should occupy the gutter made by the hand of the operator, between the uterus and sacrum. In these conditions, after a lapse of twenty-four hours or so, the reduction is complete. Two symptoms indicate complete restitution of the uterus, namely, cessation of the retention of urine and the restoration of the utero-placental souffle. The pessary may be withdrawn after four or five days from the time of the restitution of the uterus. The operation may require anæsthesia.

BRINGING DOWN THE FOOT IN BREECH PRESENTATIONS.

BONNAIRE, in a lecture on the above subject (*La Semaine Médicale*, 1893, No. 50), says: Cazeau observes in such cases that the great difficulty may be considered as being that a straight inflexible mass must pass through a curved canal little longer than itself (30 to 35 cm. against that of child, 20 cm.). Under favorable conditions of breech presentations with relaxed perineum, a very small child, or when the fœtus is macerated, the delivery is easy; but when the opposite obtains, the birth is one of dystocia. In such cases it is useless to worry with fillets or hooks, but remove the rigidity by taking from the fœtal body its props—the legs. To do this one should draw down the anterior—the easier of access—and allow the other to glide across the belly. The body then regains its suppleness. The movement of extraction can be performed above the superior strait even, by compressing the leg, bending it on the thigh, extending the whole, and finally obtaining complete lowering of the foot. Once the leg and foot are lowered in the inferior segment of the uterus and vagina, the vertebral column of the infant ceases to be bridled laterally. The author would distinguish, besides the above manœuvre, a partial drawing down of the turned-up member—simply flexing the leg on the thigh. In the above methods prolapse of the cord must be borne in mind. Bringing down both feet is possible only if the presentation is above the pelvic excavation, or partially beyond and without the inferior strait. The manœuvre ought to be only used during labor, provided the cervix be sufficiently dilated to let in three fingers of the examining hand. The integrity of the bag of waters constitutes a contra-indication in the interests of the child. This method should not be used before the eighth month of pregnancy, or if the child be dead. It is also useless in cases in which great relaxation of the pelvic floor exists. Bringing down one foot risks less a prolapse of the cord, and is easier to perform.

PUERPERAL APHASIA.

CARRE (*Archives de Tocologie et de Gynécologie*, 1893, vol. xx., No. 7) reports four cases of puerperal aphasia.

In the first the patient presented a cardiac trouble, which developed during her second confinement, and perhaps contemporary with a phlebitis following her first labor. Under the influence of lively emotion, a clot from the heart entered the Sylvian artery and temporarily cut off the blood-supply. The embolism gradually disappeared and the centres recovered their functions, cerebral paresis remaining.

In the second case there was marked manifestation of embolism limited to the left hemisphere, and due to impoverishment of the blood. In this case, two weeks after confinement, the lochia and milk suddenly ceased. Thirty-six hours later complete aphasia set in, the only words which the patient could speak being "yes" and "no." Profound coma, succeeded by fever, and convulsions of the right side. These symptoms soon disappeared.

Case III. was a primipara with a normal delivery. Nineteen days after parturition she developed headache and otorrhœa, accompanied by fever and photophobia. There was aphasia of reception and transmission. These

symptoms disappeared gradually, but five months after the onset the patient still has observable weakness of memory and intelligence. The aphasia was due to thrombosis, favored by the puerperal state and provoked by inflammatory lesions of the middle ear.

In the fourth case, eight days after delivery there appeared right hemiplegia, with aphasia and inability to protrude the tongue. Temperature normal. Intelligence seemed to be preserved. No abdominal or cardiac complications. Six weeks after confinement death occurred. In this case labor had been easy, but lactation had been excessive; and in the absence of cardiac or rheumatic symptoms, the cerebral accidents are to be attributed rather to thrombosis than embolism.

In all there are sixteen cases of aphasia reported, and of these three proved fatal. In certain cases the aphasia may be nervous in origin, neuropathic, or hysterical. In other cases it depends on albuminuria or uræmia. In nearly one-half the cases it coexists with right hemiplegia, and depends on thrombosis or embolism.

Having occurred in one pregnancy, it is liable to re-occur in the next. It usually appears about the first week after delivery.

A CASE OF PUERPERAL BONE SOFTENING CURED BY CASTRATION.

HARAJEWICZ (*Wiener medizinische Presse*, 1893, No. 27) reports an interesting case of successful removal of the ovaries for the cure of puerperal bone-softening. The patient had had ten children, and was in her eleventh pregnancy when she began to have severe pains in the loins, back, and hips. Her twelfth pregnancy was attended by more severe and continuous suffering; all the bones of the body except the face became acutely tender, and coughing caused intense pain. No visceral disease could be found; the urine was normal. The deformity of the pelvis and skeleton generally was now marked; there was no ovarian tenderness, and no uterine disease. The operation was performed under strict antiseptic precautions; both ovaries were removed and found to be normal. Complete and permanent relief from pain at once ensued, and after three months the patient left for her home. The bones were hardened, but crooked. Should this condition develop during pregnancy, it is probably best to empty the uterus; and, if it continue, castration may follow, or a Cæsarean section may be made at once, the ovaries being removed at the same time.

TWO EPIDEMICS OF AFEBRILE ICTERUS NEONATORUM WITH HÆMOGLOBINURIA (WINCKEL'S DISEASE).

WOLCZYNSKI (*Internationale klinische Rundschau*, 1893, No. 28) reports the results of his experiences in two epidemics of the above. Numerous post-mortem examinations revealed subpleural extravasations in the lung parenchyma, with thrombi in the vessels. The same condition was to be found in the liver and spleen, the former being in a state of fatty degeneration. In all these thrombic masses, or in effused blood, the characteristic bacilli were to be found. The kidney was the seat of a subcapsular extravasation; pigment masses and rods were also present. Cultures made from the above in living animals were followed by death in from twelve to seventy-two

hours. In the urine were found Teichmann's crystals, red corpuscles, coloring matter, and bile pigment.

The writer believes the disease to be the result of the introduction into the child's system of the bacterium *coli communis*; the mode of introduction in this instance was probably by washing the children's mouths with water from foul sources. The bacterium was found in the water of the well used, and the substitution of sterilized borated water was followed by a cessation of cases.

In 1892 six children were attacked with the disease, and all died.

In 1893 the same number had the disease, with a mortality of five. The other case recovered.

BACTERIA IN HUMAN MILK.

RINGEL (*Münchener medicinische Wochenschrift*, 1893, No. 27) contributes the report of a series of investigations upon the bacteria found in human milk. Various observers had reported having found the staphylococcus aureus and albus, as well as the streptococcus, both in healthy milk and in that from mothers suffering from puerperal fever. Escherich examined 25 women. Of these, 24 specimens were sterile and 1 contained bacilli. He again examined 13 with puerperal fever, and found staphylococcus in 12; 4 being of the white and yellow variety intermixed; 8 the white only, and 1 of an uncertain form. Cohn and Neumann experimented on 43 cases of milk from healthy women, and found 36 containing staphylococcus albus, 1 staphylococcus aureus and pyogenes, 3 staphylococcus pyogenes albus and streptococcus pyogenes; in 2 all the above forms were united.

The writer made a series of investigations, drawing and using milk from the deeper parts of the breast only, the experiments being made under the strictest antiseptic precautions. The milk was taken from 12 healthy and 13 unhealthy patients.

The results were as follows: 3 specimens were sterile; 17 specimens contained staphylococcus pyogenes albus; 2 specimens contained staphylococcus pyogenes aureus; 1 specimen contained staphylococcus pyogenes albus and aureus; 2 specimens contained staphylococcus pyogenes albus and streptococcus pyogenes.

An examination of the mouths of nursing infants revealed corresponding bacteria in their secretions.

TREATMENT OF ECLAMPSIA.

CHARPENTIER (*Archives de Tocologie*, 1893, p. 509), in a collection of 454 cases from various sources, gives his results as follows: Children dead before or during labor 164, or 36.12 per cent.; maternal mortality 110, or 24.88 per cent. His conclusions are as follows:

1. Every pregnant woman who is albuminuric is exposed to eclampsia. Consequently, we should examine the urine of all women during the period of gestation, and if the least trace of albumin be found, they should at once be placed on an absolute milk diet. Milk is, above all, the best preventive of eclampsia.

2. Whenever one deals with an eclamptic, if she be strong, vigorous, and

very cyanosed, start with a bleeding of 400 to 500 grammes, then administer chloral and milk as soon as possible.

3. If the patient be delicate and less cyanosed, and if the fits be less frequent, omit bleeding.

4. As far as possible let the labor occur spontaneously, and terminate without interference.

5. If labor be spontaneous, and uterine contractions fail, use the forceps or version if the child be alive. Should it be dead, we should have recourse to cephalotripsy or cranioclasia.

6. Avoid interference until the maternal parts be so dilated, or dilatable, as to make it safe for the mother.

7. Reserve induced labor for exceptional cases, where medical treatment has failed.

8. Reject absolutely Cæsarean section and forced labor; above all, forced labors by the deep incision of the neck.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

THE RESULTS OF OPERATIONS ON THE ADNEXA.

CHROBAK (*Wiener klin. Wochenschrift*, 1893, No. 49) bases his conclusions on a study of all the operations performed in his clinic during five years, with special reference to cases of at least three years' standing. He calls attention to the great difficulty experienced by surgeons in learning the true condition of patients, since they do not, as a rule, respond satisfactorily to the requests for information. The actual menace to life presented by pyosalpinx has been exaggerated, since the record of the Vienna Hospital for four years showed only fourteen deaths directly due to abscess of the ovary and tube in patients who were not operated upon (excluding tuberculosis) out of 4351 from all causes. The writer's mortality in 146 operations was 4.1 per cent. Of 100 patients who were addressed, 47 responded. It was found that 8 were perfectly well, 32 improved, 3 were not relieved, and 4 were worse than before; 26 reported that they were perfectly able to work, 15 could do more than before, but 6 could do no work. Of those who did not reply it was known that many were well, so that the writer was inclined to believe that in his own cases about fifty per cent. of the patients were entirely relieved by the operation.

He concludes that the vasomotor disturbances following the removal of the adnexa are more severe and obstinate than those attending the normal climacteric. Inflammation around the stumps is of frequent occurrence. Marked diminution or extinction of sexual desire is comparatively rare.

OVARIOTOMY DURING PREGNANCY.

MAY (*British Med. Journal*, December 2, 1893) reports an interesting case of ovariectomy in the last month of pregnancy, the patient not having menstruated since the birth of her child two years before. The tumor was of over a year's standing. A number of adhesions were broken down, and eighteen quarts of fluid were withdrawn from the cyst. The patient was seized with labor-pains during the night and was delivered of a dead child, making an uneventful recovery.

NERVE THEORY OF MENSTRUATION.

MARTIN (reprint of paper read before the British Gynecological Society) proposes the following theory: Menstruation is under the direct control of a special nerve centre situated in the lumbar part of the cord. Changes in the endometrium at the time of menstruation are under the direction of "katabolic nerves," and in the inter-menstrual periods by "anabolic nerves." Menstrual impulses are conveyed to the uterus through the pelvic splanchnics or the ovarian plexus, perhaps both. The arrest of menstruation after removal of the adnexa is due to section of the "menstrual nerves."

THE ESCAPE OF THE OVUM INTO THE TUBE.

HEIL (*Archiv für Gynäkologie*, Band xliii., Heft 3), from numerous experiments on rabbits, decides that the presence of a constant motion toward the fimbriæ of the tube (Fimbrienstrom) sufficient to carry an ovum which is in contact with the peritoneum into the *os abdominale*, has not been positively settled by experiments. Several factors must be noted. When the fimbriæ are in contact with the ovary at the point where the Graafian follicle ruptures, the conditions are most simple, since the ovum either falls directly upon a fimbria, and is carried along by the cilia, or it is floated over upon the fimbria in the liquor folliculi.

In cases in which the ovum falls into the peritoneal cavity at a distance from the tube, it either perishes (how often it is impossible to determine) or it is carried to the tube in the layer of peritoneal serous fluid, either by the peristaltic movement of the intestines or by capillary attraction.

We may also assume, with Pinner, that at the time when the follicle ruptures there is a reflex action on the cilia, which are stirred to stronger movements in order to carry the ovum along more vigorously. The writer has been unable, from his own experiments, to convince himself that the lymph current which sets toward the abdominal end of the tube is sufficient to carry an ovum across the abdomen into the opposite tube. He doubts if the question will ever be definitely settled experimentally.

THE HISTOGENESIS AND ETIOLOGY OF UTERINE FIBROMYOMA.

GOTTSCHALK (*Ibid.*) concludes from his microscopical studies that fibromyomata have their origin in a long-continued irritation, and that their development is directly dependent upon the arterial blood supply. Practical deductions from this theory are the necessity of avoiding all irritation which

might lead to persistent congestion of the uterus, such as traumatism during local treatment, sexual excess, etc. As soon as a small fibromyoma is detected especial care should be taken to place the uterus under the most favorable condition for limiting its growth. Ligation of both uterine arteries is a rational procedure at this early stage. In three cases in which the writer performed this operation there was a notable diminution in the size of the growth in two instances, while in the third it disappeared entirely (?), there being a notable relief of the menorrhagia.

The relief afforded by castration is to be referred rather to the diminution of the blood supply to the tumor consequent upon ligation of the ovarian arteries, in addition to the elimination of the periodical monthly congestion.

SARCOMA UTERI DECIDUO-CELLULARE.

SÄNGER (*Archiv für Gynäkologie*, Band xlv., Heft 1) presents another elaborate paper on the subject of this form of neoplasm, which he was the first to describe. He suggests, in common with Pestalozza, a possible parasitic origin, in view of the fact that several of the reported cases presented phenomena suggesting an infectious disease of the decidua. It seems to have no relation to septic infection. The principal clinical symptoms are persistent hemorrhages, occurring sometimes after an abortion or normal delivery, which may soon cease after curettage. Following the hemorrhages there is a constant foul, sanguinolent discharge, with later septic symptoms. The uterus gradually enlarges and assumes a nodular form, while progressive anæmia, and finally cachexia are noted. Metastases develop, especially in the vagina. Secondary growths in the lungs, and hemorrhagic pleural effusion being indicated by the appearances of dyspnœa, cough, and bloody expectoration. The disease runs a rapid course, terminating fatally within six or seven months. The condition should be suspected when profuse hemorrhages and foul discharges follow normal labor or abortion, especially if these discharges continue after the removal of retained products of conception. Puerperal septic endometritis and tuberculosis are most likely to be diagnosed in these cases. The growth is distinguished from carcinoma and ordinary round-celled sarcoma by the microscope, the history of a recent pregnancy being an important clue to the true condition. In order to confirm the diagnosis it is necessary to dilate the cervix with tents and to palpate the uterine cavity, instead of relying on the curette alone. The prognosis is bad on account of the tendency of the neoplasm to early metastasis, hence the necessity of prompt extirpation of the uterus. In every case of retention of the products of conception, and especially after the removal of placental moles, we should bear in mind the possibility of beginning sarcomatous degeneration.

URETERO-URETEROSTOMY.

KELLY (*Bulletin of Johns Hopkins Hospital*, Oct., 1893) reports an interesting case of hysteromyomectomy, in which the dilated ureter was ligated and divided under the impression that it was an enlarged vein. After removing the tumor the question of disposing of the incised ureter was considered, three modes of treating it being presented: to establish a fistula by

suturing the proximal end in the flank or in the abdominal wound, to remove the kidney, or to anastomose the ureter. The latter course was adopted, a slit being made in the lower portion of the ureter below the point of ligation, into which the proximal end was invaginated and secured by fine silk sutures, drainage with gauze being used in case of leakage. The patient made an uneventful recovery, being catheterized every four hours during the first day, after which she passed her urine voluntarily. There was no marked diminution of the daily amount of urine, and though albumin was present in considerable amount before the operation, none appeared subsequently.

REMOVAL OF THE UTERUS FOR SUSPECTED MALIGNANT DISEASE.

CORDIER (*Kansas City Medical Index*) properly holds that it is better to remove the uterus even when the microscopical evidence of malignant disease is not positive than to wait until the diagnosis has become certain, when the case may be inoperable. His conclusions are as follows:

Cancer of the cervix uteri is nearly always a local disease, which is sure to terminate fatally if allowed to run its usual course. Early extirpation is attended with a low rate of mortality and is curative in a considerable number of cases. Microscopical examination of suspected tissue does not always present the typical appearances of cancer, even when it is present; hence, one should not base his decision against operative interference on this criterion alone when there is other strong evidence of existing malignant disease.

THE SURGICAL SIGNIFICANCE OF DUST.

HAEGLER (*Beitr. zur klin. Chirurgie*, Band ix., p. 496) has found by experiment that floating germs in the air of an operating-room may be almost entirely removed by steam, and that their reaccumulation is best prevented by keeping the floor, walls, and furniture damp. Before removing the dressing from the field of operation it should be moistened with sterilized water. No dressings intended to be placed over the wound should be exposed, but they should be kept in closed dishes the interior of which is kept moistened with an antiseptic solution. The dust on the floor and walls of the operating-room is to be regarded as infectious material, the evil effect of which may be neutralized by saturating the room with steam a half or a quarter of an hour before the operation. The operator and his assistants should pay particular attention to the hair, which should be moistened or oiled. Sterilized gowns are safer if they are worn when they are still damp from the sterilizer.

PETROLEUM IN THE TREATMENT OF CANCER.

DESPRÈS (*Gaz. des Hôpitaux*, 1893, No. 68) employs refined petroleum in the treatment of inoperable carcinoma of the cervix uteri, making deep injections into the growth, which are painful but cause a speedy separation of sloughs, desiccation of ulcerating surfaces, and disappearance of odor. Injected into abscesses, petroleum causes speedy healing. In cases of acute vaginitis he uses thrice daily a douche of from three to five ounces of petroleum, which usually cures the trouble in six days. He calls attention to its

power as a disinfectant, while it does not irritate mucous membranes, though it may cause vesication (but not sloughing) of the already inflamed skin.

UNUSUALLY LARGE OVARIAN TUMOR.

MARITAN (*Gaz. Méd. de Paris*, 1893, No. 2) removed an ovarian cyst weighing two hundred pounds from a patient whose weight before the operation was two hundred and ninety pounds, her circumference at the umbilicus being ninety inches. The length of the abdominal incision was about twenty-eight inches. The patient suffered from collapse, but made a good recovery.

FOREIGN BODIES IN THE ABDOMINAL CAVITY.

ANONYMUS (*Revue des Mal. des Femmes*, 1892, No. 4) reports several cases in which foreign bodies were left in the abdominal cavity after cœliotomy. In one instance a gauze compress a foot long was discharged per rectum eight months after myomectomy had been performed, the patient having no trouble until four months after the operation. In another a strip of iodoform gauze, fifteen inches long, was withdrawn from the intestines of a young girl who had undergone salpingotomy. A month later vaginal hysterectomy was performed, as she had not been relieved by the first operation. Several months after, a secondary cœliotomy was performed on account of persistent abdominal pain. In endeavoring to separate an adherent loop of intestine, which was supposed to be the seat of the trouble, it was accidentally ruptured, when the gauze protruded. Five inches of the gut were excised, and the patient eventually recovered after having a fecal fistula. In two other cases a sponge and a forceps were missed soon after the patient had been placed in bed. In both cases the patient was returned to the operating-room, the wound reopened and the missing objects were found in the abdominal cavity.

TUBAL PREGNANCY; DIFFICULTY OF DIFFERENTIAL DIAGNOSIS.

PICHEVIN (*Nouv. Arch. d'Obstétr. et de Gynéc.,* 1892, No. 9) reports the case of a woman, aged forty years, who had always menstruated regularly. Her period was delayed twelve days; then she had an irregular flow for several weeks; after this had ceased for two weeks, she had a sudden attack of severe abdominal pain, without collapse. The hemorrhages ceased and then returned, persisting for three or four weeks. The patient then presented the ordinary mammary signs of pregnancy; the cervix uteri was soft and patulous, and the fundus extended three inches above the symphysis. To the left of the uterus could be felt a tumor, which dipped down into Douglas' pouch and extended upward into the abdomen; no fluctuation could be detected. On opening the abdomen two ovarian cysts were found (one tubo-ovarian?), but no sign of ectopic gestation.

NEW OPERATION FOR PROLAPSUS.

FREUND (*Centralblatt für Gynäkologie*, 1893, No. 47) describes a new operation for prolapsus which he has performed in five cases with satisfactory

results. Its advantages are rapidity of execution, as there is no denudation, painlessness (so that it can be performed without an anæsthetic), and the fact that there are no sutures to be removed. It is especially applicable to old women, who have neither hypertrophy of the cervix, destruction of the pelvic floor, nor tumor, etc., requiring the usual operations. It should not be undertaken if the cervix or vaginal wall is ulcerated.

The operation consists essentially in inserting three or four purse-string sutures (as in Stoltz's method) of silver wire. A curved needle is first entered beneath the vaginal mucosa at a point just above the portio, and is run in and out, emerging at the point of entrance. As this suture is tightened the cervix is pushed upward (as in Lefort's operation), and the wire is twisted. A second circular suture is inserted an inch above the first, and is twisted until the calibre of the vagina at that point is narrowed to the size of the finger, then a third suture in the same manner, the last being placed close to the remains of the hymen. The latter must not be twisted so tight as to effect kolpokleisis. The operation is bloodless, takes only a few minutes, and is well borne by old patients, who need be kept in bed only one day. In one case the patient, who had a large cystocele and rectocele, still menstruated and performed her matrimonial duties. There was no recurrence of the prolapse with severe muscular efforts. The sutures are not removed at all.

USE OF CLAMPS IN VAGINAL EXTIRPATION OF THE UTERUS.

LANDAU (*Berliner klin. Wochenschrift*, 1893, Nos. 24-26) reports seventy-one cases, with five deaths, in all of which he secured the broad ligaments with clamps instead of using ligatures. The technique differs according as the uterus is perfectly movable or the reverse. In the former case the uterus is anteflexed, after incising the vesico uterine fold of peritoneum, and is drawn down forcibly, so that the finger can be hooked over the left broad ligament, which is then secured with one or two clamps and is divided, when it is an easy matter to clamp the ligament on the right side. The ovaries and tubes are afterward drawn down and clamped off if desired. Bleeding vessels on the edge of the vaginal wound are caught with forceps. A gauze tent is pushed up into the opening and the operation is concluded, the average time in an easy case being only ten minutes. When the uterus is fixed by perimetric indurations the organ is drawn forcibly downward, while the broad ligaments are clamped in sections and divided. If ovarian cysts or pus tubes are encountered, these are pulled down into the wound and incised outside of the peritoneal cavity, then clamped off. In complicated cases, when there is extreme fixation, Péan's method of removal by *morcellement* is employed. A catheter is left in the bladder until after the clamps are removed, *i. e.*, for thirty-six or forty-eight hours. Two or three vaginal douches are given daily after the latter have been removed. The patient is usually out or bed by the eighteenth day. The writer denies that there is any more danger of sepsis with the clamps than with ligatures, nor is there any added risk of injuring adjacent viscera. He has no fear of secondary hemorrhage if the clamps are left *in situ* for thirty-six hours, nor has he noted that the patients complain of more pain than when ligatures were used.

He claims, as an additional advantage for this method beside rapidity of operating, the fact that when using clamps he would be induced to extirpate the uterus in cases in which he would not attempt it if he used ligatures, that is, when the organ was more or less fixed.

[We cannot regard the arguments advanced in favor of the clamps as commending themselves to the thoughtful reader. There seems to be no reason for completing the operation so hastily in a simple case, when the patient is usually in the most favorable general condition, while the second class of cases, in which this method is said to have its most useful application, are precisely those which are generally regarded as unsuitable for a radical operation.—C. H. C.]

MASSAGE IN STERILITY.

BUMM (*Centralblatt für Gynäkologie*, 1893, No. 42) recommends massage under the following conditions:

1. Massage by bimanual palpation in cases in which sterility is due to displacements of the uterus, or where in consequence of a former labor there results a chronic inflammatory condition of the uterus or adnexa, preventing a second impregnation.

2. Where the semen is forced out of the vagina immediately after withdrawal, due to narrowness of the canal and an abdominal irritability of the pelvic muscles causing spontaneous contraction. The author has found that massage is particularly useful in such cases.

3. Dilatation and massage of the cervical endometrium by the introduction of steel sounds, which are rubbed up and down in the canal. The special indication for this treatment is the existence of thickening and hardening of the urethra with a diminution in its natural secretion. It is preferable to curettage or cauterization, which may result in a cicatricial formation instead of the formation of normal mucous membrane.

THE RECURRENCE OF UTERINE CANCER BY INOCULATION.

WINTER (*Zeitschr. für Geburt. u. Gyn.*, Bd. xxvii., Heft 1), after an exhaustive clinical study of the mode of extension of cancer from the cervix uteri to adjacent tissues and organs, and also by metastasis, enters into a thorough examination of the subject of recurrence after total extirpation. He finds that local recurrence always begins around the cicatrix in a concentric form, and that the disease advances slowly by peripheral growth in precisely the same manner in which the original neoplasm would have extended from the cervix. He is firmly convinced that early recurrence can often be traced to the inoculation of healthy tissue with cancerous material during the operation, and deduces the following practical rules:

Do not touch the cancerous tissue with the finger while operating. Use constant irrigation with sublimate 1:1000, washing away detached cancerous masses, so that they shall not touch healthy raw surfaces. Avoid if possible tearing away, or breaking down the neoplasm; if this is done, touch the surface with the cautery. It is better to curette and cauterize at the time of the radical operation rather than a few days before, since general infection or localized peritonitis may be caused by the preliminary curettage, which would complicate or diminish the benefit of the radical operation.

PÆDIATRICS.

 UNDER THE CHARGE OF

 LOUIS STARR, M.D.,
 OF PHILADELPHIA;

ASSISTED BY

 THOMPSON S. WESTCOTT, M.D.,
 OF PHILADELPHIA.

HERPES LABIALIS IN THE DIAGNOSIS AND PROGNOSIS OF MENINGITIS.

STATISTICS show that in epidemic meningitis labial herpes is very frequent, occurring in about half the cases, while in tubercular meningitis its presence is exceptional. It would, therefore, seem that labial herpes occurring with meningitis should be a valuable diagnostic sign in favor of the epidemic nature of the disease, even when many of the symptoms suggest a tubercular origin. Upon this ground F. KLEMPERER (*Berliner klin. Wochenschrift*, 1893, No. 29) was able to make a diagnosis of epidemic cerebro-spinal meningitis in three cases where the majority of the essential symptoms strongly suggested tubercular disease. The diagnosis was verified in two of the cases by complete recovery, and in the third by an autopsy that showed no trace of tuberculosis.

Herpes labialis differs so essentially from herpetic eruptions in other regions (excepting only genital herpes) that reasonable doubt may be entertained of its relation to the group of zonas. The adversaries of the identity of the two call attention to the absence of neuralgia, the bilaterality, and the frequency of repeated attacks in herpes. The view of Gerhardts that labial herpes is a benign neuritis of the minute branches of the trigeminal is only a hypothesis; and the theory of Pfeiffer that zona is distinguished from herpes by the presence of protozoa in its vesicles has not been either confirmed or challenged by any other observer.

In the vesicles of herpes, while the contents are limpid, in subjects of pneumonia, influenza, angina, or rheumatism, divers varieties of bacteria have been observed. Bouchard has found staphylococci; Symmers a bacillus, sometimes filamentous, coloring culture media green; and Klemperer has cultivated the pneumococcus, the streptococcus, and the staphylococcus albus. According to the author the microbes found in the vesicles are the true cause of herpes, for they are present from the very formation of the vesicle. There should exist, therefore, a direct relation between the microbes of herpes and those associated with the diseases in which the herpes manifests itself; and it may be considered that herpes is only a localization of the microbe which has caused the primary disease. This view is further supported by the fact that herpes only exceptionally appears in diseases associated with a specific microbe, such as typhoid fever, diphtheria, and tuberculosis. It may be concluded, therefore, with reference to meningitis, that

labial herpes should warrant the diagnosis of the epidemic form of the disease. It must be remembered, however, that the appearance of herpes in the course of meningitis does not necessarily imply that the subject is not tuberculous, or that a mixed infection, even affecting the meninges, may not exist. In other words, the appearance of herpes labialis in acute meningitis pleads only against the diagnosis of a pure tubercular infection.

This conclusion is important from a prognostic point, but it does not warrant the expectation, as in pneumonia, that the appearance of herpes is of good omen. In meningitis, by suggesting the possibility of the presence of a more favorable type of the disease, it may encourage the hope of retrocession of the symptoms—a termination nearly, if not always, impossible in the tubercular form.

THE SURGICAL *vs.* THE MEDICO-PÆDAGOGIC TREATMENT OF IDIOTIC AND BACKWARD CHILDREN.

BOURNEVILLE (*Le Progrès Médical*, 1893, No. 25, p. 465), in an elaborate paper under this title, collects all the cases of craniectomy published since Fuller's first operation in 1878, which preceded by twelve years the more widely-known experiments of Lannelongue, to whom the operation is generally accredited. Eighty-three cases are embraced in these tables. The operative mortality was 15 or 18 per cent. Under the term medico-pædagogic treatment he includes the system of training instituted by the elder Seguin, and perfected by the introduction of modern methods, lasting over a period of years, which in nearly all cases produces decided amelioration and often restores such children to a condition permitting them to live happily in society.

The conclusions from study of the surgical aspect of treatment are as follows:

1. Surgical treatment of idiocy rests upon an hypothesis which is not confirmed by the pathological anatomy.
2. Premature ossification of the sutures of the cranium does not exist in the different forms of idiocy. Only exceptionally is partial synostosis encountered.
3. The lesions to which idiocy are due are ordinarily profound, extended, varied, and little susceptible of being modified by craniectomy.
4. The diagnosis of synostosis of sutures and thickness of the cranium cannot be made by present methods of investigation.
5. According to the majority of surgeons the results obtained by operative measures are slight, doubtful, or negative. Grave accidents (paralysis, convulsions, etc.), and death, may follow operation.

TREATMENT OF TUBERCULAR PERITONITIS IN CHILDREN.

A STUDY, based upon four cases of his own, leads CONITZER (*Deutsche med. Wochenschr.*, 1893, No. 29, p. 688) to the following conclusions:

1. Peritoneal tuberculosis is capable of spontaneous recovery; the dry form very rarely, the exudative more frequently.
2. The exudative form, which terminates in recovery, has been considered by many writers as a simple chronic peritonitis or an essential ascites.

3. All forms of tubercular peritonitis can be cured or at least benefited by laparotomy after other forms of treatment have failed.

4. The success of the operation depends upon the form of peritonitis (the exudative is more favorable than the dry); upon the duration of the disease; and upon the complications.

5. The operation is indicated when internal treatment fails; it is contra-indicated in very feeble subjects and those presenting other tubercular lesions.

HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF

EDWARD F. WILLOUGHBY, M.D.,
OF LONDON;

AND

CHARLES HARRINGTON, M.D.,
INSTRUCTOR IN MATERIA MEDICA AND HYGIENE, HARVARD MEDICAL SCHOOL.

DISSEMINATION OF CHOLERA GERMS BY AIR-CURRENTS.

N. WILLIAM (*Zeitschrift für Hygiene und Infektionskrankheiten*, Bd. xv., Aug. 25, 1893), experimenting on the spread of cholera germs by moving air, reports that while that means has been regarded as most favorable to their spread, in actual experiment it fails. Mixed with dry dust the germs live but a short time, and perish more quickly when a current of air is conducted through the dust. When the dust is distributed through large volumes of air the germs quickly die, and only when the impregnated dust is let fall into a suitable culture medium can a very small proportion of living bacilli be obtained. In other words, cholera germs adherent to particles of dust floating in and moved about by the air cannot retain their activity for any length of time nor for any considerable distance.

POISONS IN CANNED VEGETABLES

The Department of Agriculture, Chemical Division, has been investigating the matter of canned foods, under the direction of H. W. WILEY (*Foods and Food Adulterants*, 1893, part viii.). The work was directed especially to methods of preserving, preservatives employed, and food value and digestibility. As to the wholesomeness or unwholesomeness of added preservatives, the report draws attention to the fact that the great weight of testimony is to the effect that while these substances in small quantities are not injurious to health, their continued use may finally become prejudicial. It is also shown that the same quantities which prevent the action of micro-organisms, and thus prevent decomposition, are also active in the digestive organs and hinder the normal functions of the digestive ferments. There are other added chemicals in many varieties of canned vegetables used for adding to the attractiveness of their appearance. Considerable attention was paid to the

examination of the vessels containing the vegetables. The German law prohibits the presence of more than 1 per cent. of lead in tins employed for holding canned goods, but in this country there is no restriction whatever in regard to the character of the tin employed, some of which has been found to contain as much as 12 per cent. of lead. In Germany, the solder employed in sealing cans is not allowed to contain over 10 per cent. of lead, while here the analyses of numerous samples of solder employed show that it contains fully 50 per cent. In addition to this, no care is taken to prevent the solder from coming in contact with the contents of the can; large surfaces of solder on the seams are exposed to the action of the acid contents, so that lead is a very common constituent of canned goods. Another great source of danger from lead exists in the use of glass vessels closed with lead tops or with rubber pads containing sulphate of lead.

With regard to the food value of canned goods, the report shows that in such vegetables as string-beans, asparagus, etc., it is quite low, while in such as canned corn, succotash, etc., it is quite high. The lowest percentage of dry matter in American string-beans was 4.17, showing that in purchasing one hundred pounds of such material one buys 95.83 pounds of water. In one specimen of French string-beans the percentage of water was 96.13.

In the course of the investigations, eighty-one samples of canned and bottled peas were examined; forty-three were of American and thirty-seven of foreign origin. All of the foreign brands, except two, contained copper; one contained zinc. Fourteen of the forty-three American samples contained copper; twenty-nine did not. Salicylic acid was present in five French and ten American samples. Tin was present in fifty samples, lead in fifty, and zinc in fifteen.

In all, two hundred and forty-eight samples of all sorts of vegetables were examined, and in no less than one hundred and twenty-one was salicylic acid detected. Zinc was found in forty, copper in eighty-eight, and lead in one hundred and thirty-two.

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All communications should be addressed to

DR. EDWARD P. DAVIS, 250 South 21st Street, Philadelphia, U. S. A.

Or

DR. HECTOR MACKENZIE, 59 Welbeck St., Cavendish Sq., W., London, Eng.

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THE
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REPORT OF FOUR CASES OF BRAIN SURGERY.¹

BY ANDREW J. MCCOSH, M.D.,

VISITING SURGEON, PRESBYTERIAN HOSPITAL, NEW YORK; PROFESSOR OF SURGERY,
NEW YORK POLYCLINIC.

THE localization of cerebral functions has in recent years become so accurate that it was naturally thought that much progress would be at once made in the surgical treatment of epilepsy. This anticipation, however, has not been realized; indeed, the treatment of this disease by operative measures is attended by results, as far as cure is concerned, but little better than those which were obtained a score or more of years ago. It must be confessed that the great advances made in cerebral localization have thrown but little light upon the nature or treatment of epilepsy. While it is true that certain cases of Jacksonian epilepsy have been permanently cured by operation, yet we must acknowledge that operations for the cure of true idiopathic epilepsy have been discouraging.

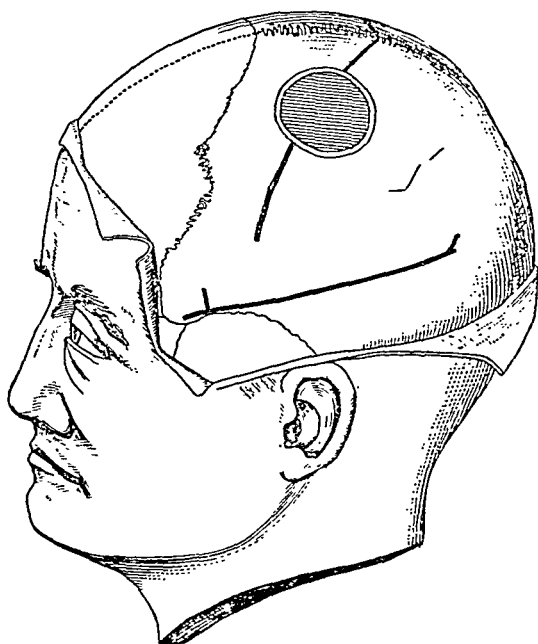
Experimentation on animals has thrown but little light upon the matter, and it is probable that most of our accurate knowledge must be derived from the observations of the pathologist and of the surgeon. On this account it is important that all cases which are related directly or indirectly to this subject should be reported. Individual cases which, while interesting, may not at the time of their report afford suggestions for the formation of general rules for diagnosis and treatment, will eventually, by comparison with similar cases, lead to inductions which will be of the greatest value.

¹ Read at the Pan-American Medical Congress, in Surgical Section.

Each one of the following cases contains some point of special interest:

CASE I. *Extra-dural hemorrhage; convulsions; operation; recovery.*—Male, aged eighteen years. On July 29, 1889, patient was found lying on the bottom of a trench in a semi-comatose condition. He had been in good health up to the previous night, when it was supposed that, while under the influence of liquor, he had fallen into the trench, which was six feet deep. The accident must have occurred after midnight, and he was brought to the Presbyterian Hospital at 8 A.M. On his admission he was very stupid, but could be aroused so that he gave his name, but not his address. Temperature, 100; pulse, 76. The scalp was contused in the occipital region, but there was no sign of fracture or hæmatoma. The pupils were symmetrical, and there was no paralysis. For twenty-

FIG. 1.



Case I. Location of clot, $2 \times \frac{1}{2} \times \frac{3}{4}$ inches.

four hours the patient showed the general symptoms of cerebral irritation (laceration)—lying on his side, with thighs drawn up, in a half-stupid state; he could be aroused by an effort, and would utter a peevish, irritable cry, jerk his arms, roll over on the opposite side, and lapse again into slumber. He refused all nourishment. His urine was drawn by catheter. At the end of twenty-four hours he became brighter, began to look about him, and drank his milk. By the fourth day there was marked improvement; he talked intelligently and asked questions, but his memory was deficient. By the eighth day (August 5th) he seemed almost natural, except for slight restlessness and occasional lapse of memory. His eyes were normal, and there was no paralysis. On the evening of this day slight twitching of the right foot and leg was noticed. On the ninth day this twitching was more noticeable, and in the evening it had extended to the right hand. There appeared to be no paralysis.

During the night he had an epileptic convulsion, beginning in the right foot and becoming general, followed by stupidity lasting half an hour.

On the morning of the tenth day (August 7th) another very short convulsion occurred. I decided in the afternoon to operate, and to expose the lower and posterior part of the motor area of the left side, as the symptoms indicated pressure at this point. The diagnosis was pressure by a blood-clot. On shaving the head no contusion or laceration of the scalp was found. By dissecting up a semicircular scalp flap the bone was exposed over the fissure of Rolando. There was no evidence of fracture or injury of the skull. With a three-quarter-inch trephine a button of bone was removed from over the centre of the fissure of Rolando. Immediately underneath a blood-clot was found, extending downward and backward. The opening in the skull was enlarged in this direction, following the clot until an opening two by two and a half inches was made. The clot was then removed in two or three pieces. It was oval in shape, three-quarters of an inch thick at the centre, and thinning out toward the edges.

The surface of the dura mater under the clot was roughened, but was not lacerated or apparently injured in any way. It was not opened. A director was swept around between the skull and dura, but no additional clot or sign of fracture could be discovered. The bone was not replaced. The scalp flap was replaced and sutured. The patient was returned to his bed at 4 P.M., and rapidly recovered from the anæsthesia. At 7 P.M. there was a slight convulsion, limited to the right leg and hand. No further manifestation of cerebral irritation showed itself, and the patient made a rapid and uneventful convalescence. He has been perfectly well ever since, earns his living as a bricklayer, and does not hesitate to go on an occasional spree.

CASE II. *Extra-dural hemorrhage; convulsions and paralysis; trephining; recovery.*—Boy, aged six years. On August 11, 1890, the patient fell down stairs and was supposed to have struck his head. He was unconscious when picked up and remained partially unconscious until admitted to the Presbyterian Hospital twenty hours later. For forty-eight hours after admission he lay quietly on his right side with thighs and arms flexed, and was apparently unconscious unless when disturbed, when he became irritable and restless, uttering sharp, peevish cries and pushing away his nourishment. Temperature ranged between 100° and 102°; pulse, 110 to 120. Pupils were equal and reacted. There was no sign of paralysis. The scalp was contused over the right temporal region. On the fourth day he became brighter, was less irritable, answered questions in a semi-rational manner, and drank his milk when told to do so.

On August 17th, the sixth day from the date of the injury, his general mental condition was very much improved; he talked intelligently, asked for food, and seemed quite happy. It was noticed, however, that sensation in the left arm and leg did not seem so acute as on the other side; there was no impairment of motion.

On the next day (seventh), in the morning, he had a distinct convulsion, limited to the left upper extremity, lasting one minute, and followed by an apathetic state for half an hour. In the afternoon another convulsion occurred, beginning in the left side of face and left forearm, and then involving the entire left upper extremity. Sensation was markedly diminished in the left arm and leg. The left upper and lower extremi-

ties toward evening were completely paralyzed. There was left-sided facial paralysis. During the night two similar convulsions occurred.

On August 19th (eighth day) the boy had two convulsions, beginning in the left hand and foot and involving the left upper and lower extremity and left side of face. His mental condition remained bright. No disturbance of sight, taste, or smell could be discovered. The eyes were normal. Complete paralysis of left upper and lower extremity persisted. Temperature, 100° ; pulse, 90. The diagnosis was made of blood-clot pressing on the motor area for left arm, leg, and face; and, after consultation with Dr. W. G. Thompson, immediate operation was decided on. The contused scalp had recovered, and there was no external sign of injury. After anæsthetization a semilunar scalp flap was dissected free, and the skull exposed over the fissure of Rolando. The bone was bared over a space two and a half by three inches, but no sign of injury was found. With a three-quarter-inch trephine a button of bone was removed at a point over the fissure of Rolando, two and a half inches from the median line. On removal of the button, in the anterior half of the circle the dura appeared normal; but in the posterior inferior quadrant it was concealed by a blood-clot. The clot extended downward and backward, and the opening in the skull was enlarged by rongeur forceps in this direction until it measured two and a half inches in the antero-posterior direction and two inches from above downward. It was then seen that a fissure of the skull ran into the posterior part of the opening. On enlarging the scalp flap it was perceived that this fissure ran from above downward and slightly forward, and at its upper extremity was joined by another fissure which ran from below upward and forward. The portion of bone between the two fissures was triangular in shape, the apex one and one-half inches from the median line. This triangle of bone attached at the base was one and one-half inches long. It was cut away, and under it was found brain tissue deprived of the dura and somewhat lacerated. The rent in the dura was one and one-half inches long, and the edges having receded left bare an area of brain corresponding to the triangle of bone removed. The clot, which in the meantime had been removed, was oval in shape, two and a half by three inches, and about one-half inch thick at its centre. The cavity was irrigated with boro-salicylic solution, the scalp flap returned and sutured except at the lower posterior angle, where a rubber drain was inserted. No attempt was made to suture the rent in the dura, as it was found impossible to approximate the edges, and the brain tissue at this point appeared to be superficially disintegrated. The patient recovered quickly from the anæsthetic, and in his struggles he moved decidedly, though feebly, the left hand and forearm, which had been absolutely paralyzed before the operation, and which had lain limp and motionless when he was fighting vigorously with his right hand and arm at the commencement of anæsthetization. This ability to move the left arm remained only for a short time, and then for the next twelve hours the paralysis appeared as complete as before the operation. He remained, however, bright mentally, and there were no convulsions; indeed, after the operation not a single convulsive movement occurred. At the end of twenty-four hours he could move his left arm with distinct force, and very feebly his left foot. Sensation remained sluggish.

On the fourth day after operation there was a marked improvement

in his muscular power. There was a discharge of broken-down brain tissue through the tube, and apparently a tendency to hernia cerebri.

On August 26th (seventh day) this had ceased, and the paralysis of sensation and motion had almost disappeared. At the end of two weeks the boy was out of bed, without sign of paralysis. He has been in good health ever since; he has attended school, is bright at his lessons, and entirely free from pain, convulsive movements, or paralysis of either sensation or motion.

CASE III. *Trephining; drainage of lateral ventricle; recovery.*—Male, aged twenty-nine years, florist; gives a history of occasional attacks of unconsciousness ever since he was twelve years of age. He describes them as beginning with a sudden pain in the cardiac region, followed by tumultuous beating of his heart and ending in syncope or unconsciousness, which lasted for a few seconds and left him weak and exhausted. Convulsive movements had never been noticed. These attacks were very infrequent, sometimes two and three years intervening between them. The patient had always been of a nervous and excitable temperament, and from the history it was doubtful if the attacks were true epilepsy. His general health had been fairly good up to the time of an accident, which occurred on October 29, 1892. On that day, while carrying a stove down stairs, he was pushed from behind and precipitated to the foot of the stairs. He was stunned for a minute or so, but did not lose consciousness. A short time afterward, on account of the hemorrhage from a scalp wound, he was brought to the Presbyterian Hospital. On admission (October 29, 1892) two scalp wounds were found in the occipital region, each about two inches long. There was an extravasation of blood in the left eye and hemorrhage from the left ear. He was unable to raise his left arm. For the next few days he was very stupid. He would answer questions, but unless aroused he took no notice of his surroundings. His temperature ranged between $99\frac{1}{2}^{\circ}$ and $100\frac{1}{2}^{\circ}$. The paralysis of the left arm gradually disappeared, and mentally he became brighter, though complaining of severe headache. By November 10th the paralysis had entirely disappeared, and though somewhat stupid and dazed, he was allowed to sit up. While sitting at the side of the bed in a chair he had a general convulsion, lasting ten minutes, followed by an apathetic condition for a couple of hours afterward, and by slight anæsthesia of the left arm. For the following two weeks he complained of headache and dizziness, but his mental state gradually improved. He had no further convulsive movements until December 3d, when a general convulsion occurred lasting two minutes. It was followed by complete anæsthesia of his left arm and leg and hyperæsthesia of the right side and marked tenderness of the cicatrix in the right occipital region. The reflexes were absent on the left side, and exaggerated on the right side, where there was also marked ankle clonus. On the following day these symptoms still persisted, and in addition partial loss of power of his left hand was noticed and extreme sensitiveness of his right eye to light. Gradual improvement took place, and in forty-eight hours more these signs had entirely disappeared. He was still, however, stupid and at times excitable, but on December 7th he felt well enough to leave the hospital, though strongly urged not to do so. He remained at home for nearly a month, during which time he had two convulsions. Immediately after his second convulsion, January 4, 1893, he was brought into the medical

side of the hospital in an extremely excitable and yet somewhat dazed condition. Temperature 101° , pulse 100.

January 5. A general convulsion, lasting six minutes.

11th. A general convulsion.

17th. A general convulsion.

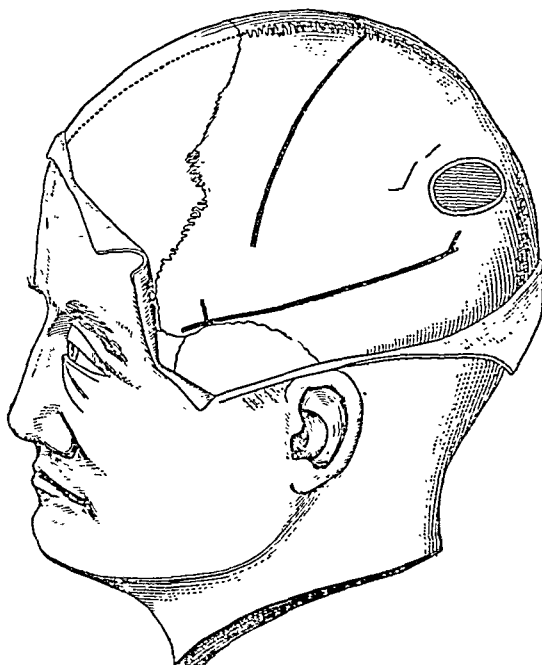
18th. Two general convulsions.

From the 17th to the 25th a general convulsion occurred every morning and often a second one at night. The convulsions lasted from three to ten minutes, and were very violent. There was no regularity in the muscles which were first affected. His mental state continued to grow worse; his memory was entirely lost; at times he lay in a stupid, almost semi-comatose state, and at times was excited and delirious. He complained of pain in the back of his head, and the slightest pressure on the occipital cicatrix caused him to cry out with pain. His temperature ranged between 99° and $100\frac{1}{2}^{\circ}$; pulse between 85 and 100. After January 25th he became steadily worse, the convulsions became more frequent, averaging five in the twenty-four hours; his stupor increased and he became quite irrational, sometimes for an hour or so remaining in a state of semi-coma, and then again becoming very restless and noisy. On January 28th, Dr. A. H. Smith, the attending physician, felt that unless relief could be derived from operation he could not live more than a week or two, and on the next day he was transferred to my service on the surgical side. In the meantime he had been examined by a number of neurologists and surgeons, and most of their diagnoses inclined toward syphilitic gumma or general paresis. Operative interference was, in the opinion of all of them, contra-indicated. Dr. Smith, however, sent him to me in the hope that he might be benefited. He remained under observation for three days more, during which time his symptoms remained very much the same, with the exception that his temperature ranged between 100° and 101° , and his pulse increased in frequency (110). He was at no time rational, lying for part of the time in a semi-comatose state, and then again became excited and delirious, imagining himself persecuted and making violent efforts to get out of bed. He was very hyperæsthetic over his whole body, but especially so on the back of his head and most markedly at the seat of the cicatrix in the right occipital region. His eyes were normal. His tendon reflexes were greatly exaggerated. As he was daily losing ground, both physically and mentally, I decided, on January 31st, to do an exploratory trephining.

He was anæsthetized with chloroform, and a semicircular scalp flap was raised, the cicatrix being in its centre. This cicatrix, which was situated just above the middle of the superior curved line of the right side, was found adherent to the bone. On exposing the bone a roughening and what seemed to be a stellate cicatrix was found. At this point, which was just above the lateral sinus, with a one-inch trephine a button of bone was removed. The inner surface of the button was roughened, but the elevations were smooth and comparatively slight, and certainly could have produced no depression of either the dura mater or brain. The dura was found thickened and roughened over an area three-quarters of an inch square, being perhaps twice its normal thickness. By rongeur forceps the opening was enlarged, mainly upward and inward. A flap of dura was raised. No evidences of clot were found, and the pia mater looked normal. There was evidently, however, a great

amount of intra-cranial pressure. The brain bulged out through the opening in the skull as if there was not room for it inside of the cranium. The cerebral tissue, covered by pia mater, projected through the opening in the skull half an inch beyond the external surface of the bone. Even after setting the patient upright this bulging was still very noticeable. This extreme pressure was naturally supposed to be due to excess of intra-cranial fluid, as no tumor or hardness could be felt on palpation of the brain substance, which, though congested, did not appear unnatural. A hypodermatic needle was thrust into the brain in three directions, but no pus or other fluid was obtained. It was then decided to tap the lateral ventricle, and for this purpose a long hypodermatic needle was passed into the right lateral ventricle and about

FIG. 2.



Case III. Location of trephining.

an ounce of thin straw-colored fluid removed. The needle of the aspirating syringe was then withdrawn and a trocar and canula thrust into the ventricle, and the canula left for permanent drainage. About thirty minutes more were consumed before the final dressings were applied, and during this time the fluid continued to issue from the canula at the rate of a drop every four or five seconds. It was estimated that nearly an ounce escaped in this manner. The canula was carried out through an opening made in the middle of the flaps of dura and scalp, which were returned and sutured. The patient recovered slowly from the operation, and for the following twenty-four hours was stupid and somewhat restless. In the second twenty-four hours he was brighter though still restless and irritable. At the end of forty-eight hours the canula, which had been so arranged by fixation to pads of gauze that it could not slip farther out or farther in, was removed. From the amount

of moisture on the pad, which absorbed all the ventricle fluid, it was estimated that between one and two ounces had escaped. This estimate, however, is unreliable, and the amount may have been much greater.

After the third day (February 3d) the patient improved rapidly. There had been no signs of convulsive movements since the operation, and he remained entirely free from even twitching of the muscles during his convalescence. At the end of a week he was quite bright and cheerful, talked intelligently, asked for food, was entirely free from delirium or delusions, and had perfect control of himself. The reflexes seemed to have returned to their normal state, the hyperæsthesia had disappeared, there was no sign of paralysis, and he was able to read his bedside notes. His eyes were examined and proved normal. His memory was still defective, and he complained of occasional headache. At the end of two weeks the patient was out of bed, bright, and cheerful. At the end of a month (March 1st) he was apparently well, and made himself very useful in the work of the ward. His memory of events during the past year was defective, but otherwise he seemed perfectly well. On one or two occasions, after excitement, he complained of headache, but otherwise had no pain. On March 24th, after an exciting interview with some of his friends, he had some twitching of the muscles of the face and hands, but no distinct convulsion. On March 28th he went out on a pass and was brought back by ambulance, in a very stupid state, evidently caused by alcohol. On April 3d he left the hospital, commenced drinking, and in the evening was carried to another hospital in a condition of semi-coma. Alcoholic intoxication was, however, evidently the cause of his mental state, as a day later he resumed work. He has reported to me within a week, seven months after operation. He has been at work for the past five months, and has not missed a single day. His health is perfect, he looks bright and happy, and his employers report that he is perfectly intelligent and trustworthy, and that his memory is good. He has no headache and no tenderness of the cicatrix. He has been intoxicated more than once without bad consequences. Indeed, up to the present time he is perfectly cured and there seems to be every prospect that the cure will be permanent.¹

There can be no doubt that the operation saved this patient. It is difficult to name the disease or lesions which caused his grave symptoms. It is possible that the cicatrix in the dura was the cause of the accumulation of intra-cranial fluid. In many ways his symptoms resemble those of the disease which has been described under the name of meningitis serosa.

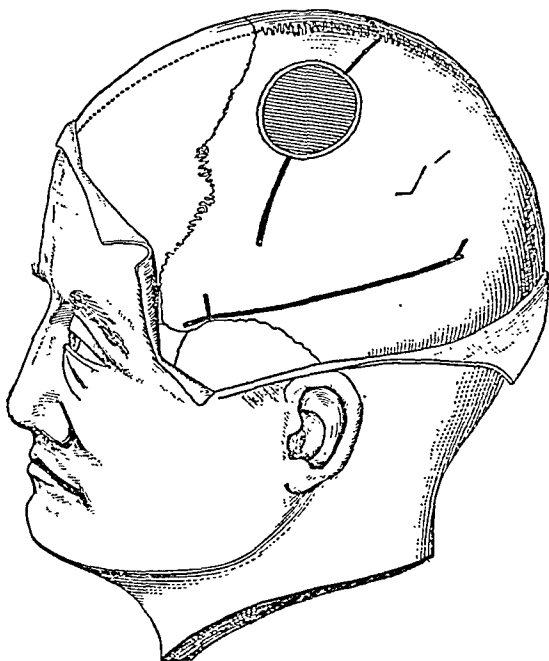
CASE IV. *Sub-dural organized clot; epilepsy; trephining.*—Female, aged six and one-half years; was kindly referred to me by Dr. M. A. Starr. The family history is good with the exception of the maternal grandmother, who was an epileptic. The mother reports that the child's health has been good with the exception of the fits. She states that at the age of one and a half years the child had a series of convulsions coming on suddenly without apparent cause, and lasting several hours. As a result, there was a partial paralysis of the right arm and leg, which

¹ January 16, 1894. The patient at the expiration of eleven and a half months from time of operation continues bright and intelligent, and no convulsions have occurred.

persisted for several weeks and then disappeared. The next convulsion occurred at the age of four years, and one fit followed another for two or three hours, and resulted in weakness of the right hand, which lasted for a few days only. During the next six months she was perfectly well. At four and a half years, there was another convulsion, without resulting paralysis, and at five years another severe convulsion, since which time she has remained partially paralyzed in her right arm and leg. For nearly a year no further convulsions occurred, though the paresis remained.

For six months previous to her entrance into the hospital (since September, 1892) she has had what the mother calls "spasms," in which the head turned always to the right, and convulsive twitching of the right hand and occasionally of the right foot followed. For the first

FIG. 3.



Case IV. Location of organized blood-clot.

four months, when she was without treatment, these averaged ten in the twenty-four hours; since treatment has been carried out, the average number has been four or five. On examination there was marked atrophy of the muscles of the right arm and forearm. She had very little use of the right upper extremity, especially of the hand. At times there was marked rigidity of the muscles of the hand and forearm, the fingers and thumb being flexed and tightly clenched in the palm. The circulation of the hand was impaired. Occasionally she could hold a large object in her right hand, but as a rule she was unable to take hold of any article. At times athetoid movements were present. There was slight atrophy of the muscles of the right leg and foot, and a distinct dropping of the toes (hemiplegic gait). Mentally the child is bright, though very bashful; eyes normal and general nourishment

good. Dr. Starr had made the diagnosis of pressure on the motor area for the right arm and leg, and sent her to me for operation. He advised an opening to be made over the arm centre, and accordingly, after reflection of a scalp flap, with a one-inch trephine, a button of bone was removed over the fissure of Rolando, about one and a half to two inches to the left of the median line. On removal of the bone, the dura was found to have been adherent to its under surface. By rongeur forceps the opening in the skull was enlarged downward and forward to double its original size. The dura seemed to pulsate less vigorously than usual. It was incised along the upper border of the opening and a flap turned downward. As the dura was reflected, its under surface was seen to be rougher than normal, and lying on the top of the pia mater was seen a translucent, reddish membrane. This membrane, which was about the thickness of a sheet of note paper, covered the area of brain exposed and extended beyond. It was lifted up and removed, but there remained a border which extended beyond the opening in the skull for about three-fourths of an inch, except at its lower part. This was afterward removed by a small spoon from under the dura, the patient's head being elevated.

So-called oedema of the pia was marked, the membrane being lifted off the brain by a layer of fluid nearly half an inch deep. The pia was incised between the veins in two or three places, and several drachms of fluid oozed out. As the fluid escaped it was seen that this part of the brain was depressed, as if the convolutions were atrophied. The brain on palpation appeared normal and there was no justification for further exploration. The flap of dura was replaced and sutured, as was also the scalp flap. The bone was not returned.

The child recovered quickly from the operation and showed very little shock. For three weeks following there was no special change for the worse or the better. The convulsions continued as before, as did the paralysis. It is now five months since the operation. The child has gained considerably in weight and appears brighter, but the convulsions have not been modified by the operation; they occur as frequently, and their character is the same. A slight improvement, however, has taken place in the paralyzed muscles; the child walks with less of a limp, and she can now grasp objects with her paralyzed hand. The muscles are still weak and lack proper co-ordination, but there is undoubtedly an improvement. I should consider the prognosis bad as far as the convulsions are concerned, but I should expect a further improvement of the paralysis. The membrane removed was undoubtedly an organized blood-clot, and the most probable cause of the hemorrhage was a pachymeningitis hæmorrhagica.¹

¹ January 16, 1894. During the past four months the progress of the case has been most interesting. In the beginning of October the convulsions became more frequent, averaging from twelve to eighteen in the twenty-four hours. The patient was again admitted to the hospital for the purpose of inserting gold foil between the dura and brain. The child, however, had slight fever, and in a few days it was evident that she had typhoid fever. The case was rather severe and protracted. The remarkable fact about it was, however, that from the time the disease was well established not a single convulsion occurred. The child has now been well for about two months, and during this time she has been entirely free from any convulsive movements. She has grown considerably, and the partially atrophied muscles of her right arm and leg seem to be fuller and stronger, though a certain amount of paralysis still persists.

Within the last few months I have trephined three other patients for epilepsy. All have recovered from the operation, but it is as yet too soon to report on the results. The mere removal of a button of bone from the skull seems to improve nearly all epileptics for a few months, and it is rather misleading to report on the condition of these patients before sufficient time has elapsed for the disappearance of the amelioration which may be attributed to the operation *per se*.

THE EARLY DIAGNOSIS AND PRACTICAL SURGERY OF CANCER.

BY HERBERT SNOW, M.D. LOND., ETC.,
SURGEON TO THE CANCER HOSPITAL, LONDON.

THAT a considerable proportion of the cases operated on for malignant disease fail to secure their due measure of success, simply for want of timely recognition, is, to the practical surgeon, a mere truism. The obstinate tendency of "cancer" to "recur" was of old explained by a supposed "constitutional origin." Modern science more correctly attributes this to the infective and autositic properties of the cells concerned, with the early transmission of nuclear fragments by blood or lymph currents to other parts than that primarily attacked. Hence the vital necessity for a prompt diagnosis, in localities amenable to the resources of surgery, of actual or potential malignancy, before this transmission has had time to take place, or at least to proceed very far.

To recognize a malignant growth in its later stages is always easy; to gauge with accuracy its real nature from the early inception of the disease-process is often extremely difficult. Yet a fairly confident idea of the state of the case may generally be acquired by due regard to certain *a priori* probabilities, in addition to the physical signs proper to each individual instance. Thus, malignant lesions are specially prone to attack degenerating organs and degenerating people. With the exception of a numerically small congenital group of tumors, which I have elsewhere classified under a special term, *Blastoma*, and which mostly differ from ordinary cancer in arising spontaneously, malignant new-growths are almost entirely restricted to women above the age of thirty-four, to men past forty. Further, they appear in organs which have fulfilled their functional purpose and are undergoing devolution, as now effete appendages, *e. g.*, the sexual organs of women; or else in tissues whose vitality has become conspicuously impaired, such as the buccal mucous tract of men. Hence we are bound to look with grave suspicion upon any incipient tumor-formation in these parts of the respective

tion. Obvious *physical weakness*, daily increasing, *lumbar pain*, *fetid discharge*, are phenomena which confirm suspicion of cancer, but which may also proceed from other causes.

The male sex differs conspicuously from the female in the non-possession of structures which, like those above referred to, pass through a period of activity followed by a long stage of devolution and of entire inutility to the organism. So men furnish a relatively small proportion of cancer cases; and would even less often thus suffer, were it not for certain noxious habits. They are necessarily more prone to sarcoma than women, from their more laborious occupations and greater liability to hard knocks or sprains. But the majority of male cancer-patients suffer from epithelioma of the lips, tongue, or buccal tract generally, the mucous membrane having previously become unhealthy and of low vitality. A very considerable proportion show marks of antecedent syphilis; others are alcoholic individuals, who also smoke, both of which practices directly deteriorate the epithelium. Men of the laboring classes rarely pay the attention which women do to cleanliness. The mouth in particular is commonly foul, and decayed tooth-stumps are seldom interfered with; hence the natural sequence of epithelial cancer, almost invariably the manifest result of neglect.

A form of cancer common to both sexes, which is specially apt to be confounded with a non-malignant affection, is that which primarily attacks the lymph glands. Twenty-four cases developed in superficial glands are cited, with their mode of causation, in my work on *Cancers and the Cancer-Process*, p. 337; those which have appeared in the deeper organs are generally viewed and reported as "round-celled sarcoma of the small-celled variety." This species is commonly referred to as "lympho-sarcoma;" as the word "sarcoma" is already so overloaded with diverse meanings, I prefer to entitle it "lympho-carcinoma," a term much more in accordance with its clinical course and natural affinities. It is also not seldom spoken of as "lymphadenoma;" but it has nothing in common with the malady to which that title more correctly appertains, viz., Hodgkin's disease, a general pyrexial disorder, involving the *synchronous* enlargement of numerous glands throughout the body, usually after exposure to cold and wet. The cancerous neoplasm, on the other hand, follows traumatism, and is always gradually diffused from a single centre. Lympho-carcinoma unfortunately begins as a painless, gradual enlargement, first of a single gland, then of a cluster, in no way differing from that so often seen in young, delicate people of strumous tendencies. Here, however, we must particularly note the diagnostic value of antecedent probabilities. In children and the youthful of both sexes, the lymph glands readily enlarge on slight provocation; in the old, the reverse is the case, and with such the slightest increase in bulk is highly suspicious. The cancerous process in these organs is

seldom found under the age of thirty-four, and is usually consequent on a blow or strain. Thus an enlarged lymph gland in the neck, axilla, or groin of a boy of fifteen is assuredly not malignant—at least, primarily so; whereas one exactly similar in outward appearance, only occurring in a man of forty, not associated with an obvious septic cause in the vicinity (*e. g.*, suppuration, syphilis, diphtheria) and following no mechanical injury, will almost as certainly prove to be an incipient cancer. Yet I have seldom or never met with one of these distressing cases, examples of one of the most virulent and rapidly extending forms of malignant lesion, in which the primary growth has not been assiduously painted for weeks or months with iodine. Such delay has necessarily involved extensive diffusion to distant glands and viscera, with consequent sacrifice of life. A prompt exploratory incision, followed by very free extirpation of all the glands which can be found near the diseased area—whether of increased dimensions or not—would alone have offered a chance of rescue.

In arriving at a conclusion upon any doubtful case, it is thus always desirable to employ both general and local considerations to mutually balance and control one another. Of the need for this rule, too often neglected, the case of the late Emperor Frederick affords a striking example. He was a man of fifty, and had occasion frequently to induce congestion of his vocal cords in the issue of martial orders. When, therefore, he began to suffer from steadily progressive laryngeal symptoms, the *a priori* probabilities in favor of epithelial cancer were very considerable. Yet in fallacious reliance upon certain microscopic indications of no more than merely negative value, the only measure which afforded a prospect of cure was rejected, with quickly fatal result. The same historical event further demonstrates what is familiar to the practitioner in cancer, that the microscope for diagnostic purposes is of doubtful use. Its conclusions may be taken without hesitation, for positive purposes; but rarely or never for the negative. They may show that cancer is present, but cannot be trusted to prove its absence.

When we pass to matters of treatment, it is of equal importance not to lose sight of general principles. Malignant growths destroy life, as has been pointed out, by means of their infectivity, and by the metastases secondarily transmitted to more or less distant parts. The primary tumor often does little, sometimes practically nothing at all, to kill the unfortunate patient; it is the secondary offshoots with which we must grapple, if we wish to effect a cure. Now, carcinoma and epithelioma, very rapidly, as a rule, infect the chains of lymph glands in the track of the lymphatics leading from the part affected. And the consequent increase in bulk of these glands does not palpably ensue, until they have been for at least several weeks the seat of malignant parenchyma. It is thus of vital importance always, in surgical excision of these

lesions, at the same time to remove thoroughly all the dangerous lymph glands in the "infection path;" and this, if possible, *before enlargement has been suffered to take place*. In the proper working out of this maxim, combined with early diagnosis, lies all the best hopes of improvement in the cancer-surgery of the future.

On the other hand, a true sarcoma does not (unless in very rare instances) attack adjoining lymph glands, by way of the lymphatic vessels. If then we find these structures enlarged in the neighborhood of such a tumor, we know that there are cell particles circulating in the blood, with concurrent visceral metastases; hence, that the case is beyond the hope of cure by an operation.

For surgical purposes each individual instance of malignant disease must be regarded, and carefully dealt with, on its own merits. We have, in the first place, to consider the particular species concerned, with its liability to infect the lymph glands. Next we must think of the organ attacked, and of its relations; of the tissues which are most readily involved, or which resist the advances of the infiltrating cells; of the age or physical condition of the patient; of the best methods of operating, etc. It is material to remember that, unless encapsuled, the palpable tumor-formation constitutes only a fractional portion of the part actually diseased; impalpable cell-colonies lurk far beyond the visible limits of the former. Fasciæ, capsules, tough fibrous structures in general resist the inroads of the advancing cell-army; soft and vascular tissues readily yield. Under some circumstances, as commonly when the tongue is the seat of advanced cancer, it is advisable not to expose the individual to any considerable hemorrhage; and a burning instrument, such as the galvanic *écraseur*, is preferable to the knife or scissors. Local escharotics are useful for small superficial lesions, never for such cancerous growths as infiltrate the tissues deeply; the best is *potassa fusa*, its action (and with this all pain) ceasing instantaneously on contact with water. *Tinct. chloride* is efficient, but horribly painful and barbarous. Even for purposes of temporary palliation it is often of more advantage to the woman to clear out thoroughly her axilla than to amputate the primarily affected breast. Severe and protracted operative procedures upon persons already in an exhausted condition from long-standing malignant disease are greatly to be deprecated. Under existing conditions of practice, wherein cancer is seldom brought under the notice of the operating surgeon in its incipient stages, comparatively few operations should take place; but these should be searching and thorough. We shall do far more in the future by carefully perfecting those methods of treatment we already possess than by too eager a search for novelties.

Regarding cancer, lastly, from its medical aspects, nothing is more pernicious either to the sufferer or to the profession than the custom,

which has somehow crept in, of withholding *opium* from the average patient until he or she is worn out with pain. This it is which, combined with the results of hesitant diagnosis, so conspicuously impels these unhappy people to the ever-blatant quack. *Opium*, persistently given from the earliest moment at which there is reason to believe the disease incurable by surgical means, not only materially prolongs the individual's life, but also has often a most marked influence in arresting the progress of the growth. A carcinomatous breast thus dealt with previously to the stage of ulceration may often be successfully diverted from a rapidly advancing tumor into that withered "atrophic" induration which permits many years of fairly enjoyable life. With this should be conjoined as passive and vegetative a mode of existence as possible; and to such, careful nursing will materially conduce. *Cocaine-hydrochlorate* internally administered is a useful adjunct to the opiate treatment. Its advantages are best seen in malignant disorders of the alimentary canal. Iron, arsenic, quinine, tonics in general are useless, except as *placebos*.

A DOUBLE OVARIECTOMY, PERFORMED FIFTY YEARS AGO
BY THE LATE DR. JOHN L. ATLEE, OF LANCASTER,
PENNSYLVANIA, UPON A LADY WHO IS STILL
LIVING AND IN EXCELLENT HEALTH.

BY ROBERT P. HARRIS, A.M., M.D.,
OF PHILADELPHIA.

ONE of the great defects in surgical records is that they so rarely enlighten us upon the subsequent histories of cases reported as "recovered" or "cured." The term used often simply means that the patient did not die as the direct result of, or as a sequence to, a dangerous operation. We all know that the prolongation of life as the effect of a surgical measure should not be taken as evidence that all of the pain, suffering, or disability in the case in question, has been set at rest. Many a life has been prolonged, with a conviction that the restored health could only continue for a season; and many an extended existence has been one of very doubtful value to the still suffering victim. Absolutely perfect cures, remaining such, without any accompanying drawback, are of such a measure of interest that they should be specially noticed; and this is peculiarly obligatory when the patients have survived through a long series of years. We therefore take great pleasure in recording a case which has several features of note, viz.: 1. The patient has lived longer after an ovarian exsection than any subject whose case is on record. 2. As far as can be ascertained, she was the first woman from whom two ovarian tumors were exsected at

one operation, in any part of the world. And 3. She was the first subject upon whom the late Dr. John L. Atlee performed an ovariectomy, out of his list of eighty cases, covering a period of forty years.

It will be noticed that I use the term "ovariectomy," just as we do "hysterectomy," "nephrectomy," and "splenectomy," in place of "ovariotomy," which certainly does not excise or extirpate. I do not like either term, because they are compounded of Greek and Latin; but if it is proper to use "ovariotomy," it is more correct to use "ovariectomy" in the sense in which the former is usually applied as a surgical term. And besides, ovariotomy is much the older operation of the two, dating back to a period one hundred and eight years earlier, or to 1701, while the exsective method of Ephraim McDowell, of Danville, Kentucky, was not inaugurated until 1809. Mr. Robert Houston, of Glasgow, made the first incisive operation (ovariotomy) in 1701, and Mr. Lawson Tait was *technically* correct in claiming an "ovariotomy" for him; but there is nothing in Houston's report that can be strained to convey the idea that he exsected an ovarian cystoma, although the woman was cured and lived thirteen years. Other ovarian sections, *incisive* and *not exsective*, have been from time to time performed since the day of Houston, and are still occasionally resorted to as a matter of safety. The late Dr. George H. Lyman, of Boston, collected up to 1856, seventy-three cases of true ovariotomy, of which twenty-two were cured, twenty-one died, and thirty were "not radically cured," a fistula still remaining. I have seen a perfect cure follow in three weeks after incision, washing out the densely adherent cyst, and drainage, in a case where the whole interior structure of the ovarian multilocular growth had lost its vitality and been broken down through loss of vascular support.

To cut down upon and remove the cystic ovary, as in the Crawford case under McDowell, required a great deal of boldness in the surgeon, and nerve in the subject, who well deserved her restored health and thirty-two years of prolonged life.¹ We must bear in mind that early ovariectomies during nearly half a century were endured without anæsthesia; also, that surgeons down to the day of Mr. William Jeaffreson, of Framlingham, England, in 1836, always opened the abdomen by the long incision; and that many continued to do so, as Dr. Atlee did, until a much later period. The knife now, and fifty years ago, is, and was, looked upon with very different degrees of dread and fear of results. To talk surgery to the unprofessional ear in these days of anæsthetics and antiseptics does not excite one-tenth of the antagonistic distaste that it did fifty years ago. Operations without pain, and with a minimum risk of death, have in recent days revolutionized the whole field of sur-

¹ From the age of forty-six to seventy-eight.

gery, and we who have lived long enough can appreciate the change. It required very persuasive powers, and a manner and character to inspire confidence, to secure a willingness on the part of Dr. Atlee's patient, who belonged to the higher walks of life, to accede to his proposed operation for her radical relief.

The late Dr. John L. Atlee was born in Lancaster on November 2, 1799, and had been a graduate of the University of Pennsylvania for twenty-three years when he undertook the operation in question in his own city, where he must have felt that a failure to succeed would almost ruin his professional standing. Mild, gentle, and amiable, he had moral and physical courage in abundance when convinced that he was in the line of his duty. He had studied the case of his patient for three and a half years; had tapped her on several occasions; had utterly failed in arresting her disease by medical treatment long kept up; and her rapidity of ascitic accumulation made it a question of operation, or in a short time, of death; hence his determination to adopt what was then a very desperate alternative. He deserved and obtained success, and the lady has been amply repaid for the confidence she reposed in him.

As a full report of the case appeared in *THE JOURNAL* for January, 1844, it will only be required now to note certain salient points.

Miss C. R. P., at the age of twenty-four, in October, 1836, first discovered a change in her abdominal contour, having been led to notice it by an attack of pain in the left iliac region lasting a few days, and accompanied by flatulence. After a few weeks she had a similar attack upon the other side, and in time her abdomen became sensitive to pressure, enlarged from an accumulation of ascitic fluid, and finally required tapping, which was performed on June 2, 1838, five years before her ovariectomy, when twenty pounds of fluid were drawn off. She came under the entire care of Dr. Atlee on December 6, 1839. After the performance of a third tapping, in 1841, there was an apparent arrest of the disease for four months, after which she again filled up, and was tapped for the fourth time in July, 1842. In December, 1842, Dr. Atlee tapped her again, and removed twenty-two pounds. On May 13, 1843, she was tapped for the sixth time, and thirty-two pounds of fluid had accumulated in five months. After the evacuation, palpation revealed the presence of a tumor in the pelvis, and a vaginal exploration in addition made it evident that there were two, which were believed to be ovarian and the cause of the effusion of ascitic fluid. It was then decided to remove these morbid growths, which was accomplished on June 29, 1843, when the season was favorable.

By the time of the ovariectomy, forty-seven days, there had accumulated twenty pounds more of ascitic fluid, and this being removed, the abdomen was opened in the *linea alba* to an extent of over ten inches. This long incision brought the two tumors into view, and the right one was drawn upon for removal, and its adhesions in the pelvis separated. Three silk ligatures secured its connections against hemorrhage—one being applied to a band of bloodvessels feeding the growth, a second to an artery in the adhesions, and a third to the pedicle proper, including

the Fallopian tube. This tumor when *in situ* projected four inches above the *linea ilio-pectinea*.

The left tumor was smaller, had formed no inflammatory adhesions, projected above the pectineal line about two inches, and was easily lifted out of the pelvis, after which it was secured by two ligatures and then cut away. The five ligatures, having one end cut off near the knot—which was then the habit in amputations and extirpations—were brought out at the lower angle of the wound and secured, and the abdominal cavity was cleansed by sponging. The wound was now closed by seven sewing-needles inserted at intervals of an inch, and wound in the figure of 8 form with silk, as in the hare-lip suture, strips of adhesive plaster being placed between them as an additional security.

The right ovarian tumor weighed eighteen ounces; was semi-solid; was composed of six or eight cystic growths, and bore upon its top an eminence consisting of numerous small hydatids of a cream-color.

The left tumor weighed fourteen ounces, and was composed of four cysts. The two tumors had been of very slow growth, as they had evidently been forming for more than six years, an evidence at the time that there should be no fear of malignancy. Undeveloped ovarian cystomata such as these were not the form of cystic growth removed in the time of McDowell, which were usually large and bag-like.

The lady made a good recovery, and was only bled once, which was to the extent of ten fluidounces, eleven hours after the operation, when her pulse rose to 136, but it fell to 120 after the venesection. There were no alarming symptoms during her convalescence after the first twelve hours, although there was a traumatic excitement of pulse until the needles were removed on the fifth day, after which it fell to 100. At this time the abdominal wound was found to have united by the first intention, and to present no appearance of inflammation. The silk windings of the needles were not removed, as they helped to secure the sides of the wound in apposition. The pulse did not fall below 80 until the eighteenth day.

The first of the five ligatures came away on the fourteenth day, and the second on the fifteenth. The fourth held on for fifty-eight days, and the last for eighty-nine; this one enclosed the Fallopian tube. The fistula, kept up all this time, healed very soon after the last ligature came away, which happened on September 26th, when she was away on a visit.

The patient was remarkably well by the tenth day, with a clean tongue, sleeping well, able to sit up, and to walk several times across her room. On July 20th, three weeks after the operation, she took a ride of two miles, and, two days later, of five or six miles; and on this date, Saturday, July 22d, the doctor ceased his regular attendance. The protruding ligatures occasioned some bladder trouble, as they passed around this viscus, and irritability was increased when they were rendered tense, in the hope of hastening their removal.

Great improvements have been made in the technique of this operation in the past fifty years, but better curative results have never been attained. The form of suture adopted by Dr. Atlee is one of the oldest in surgery, and one which was a great favorite with him in securing wounds. It has, perhaps, gone entirely out of date in the closure of

long incisions; the interrupted suture having been recommended for abdominal work in the days of Ambroise Paré, three hundred and fifty years ago.

At the time of her operation Miss R. was thirty-one years old, and in a condition that must soon have proved fatal. She became eighty-one in June last, and has outlived the operator, his brother who assisted him, three of the four invited physicians, and the three medical students present. Of this party of nine, Dr. J. August Ehler, of Lancaster, a graduate of 1841, alone survives. Miss R. is of average height, erect, and weighs about one hundred and twenty pounds; is in full possession of her faculties, moves about the house freely, walks out and to distant points, corresponds with her friends, and is a remarkably well-preserved woman for her age, having an appearance of about sixty. In a letter written by her on the semi-centennial celebration of her operation, in which no tremulousness of hand appears, she says: "I am glad that I submitted to the dangerous and painful ordeal, so that others might be benefited by the increase of light gained through the operation of which I was the subject."

It is hardly probable that this case can be paralleled in any part of the world; if it can be, it is to be hoped that this report will bring the case to light. I reported in the JOURNAL for October, 1885, an autopsy made upon a Cæsarean subject, who survived her operation half a century and outlived the operator and all who were invited to see her delivered of a baby who still lives at the age of fifty-eight; but such cases of longevity in health, after capital operations, are of very great rarity thus far, although in the improvements in our science and the number of subjects operated upon, they may become less so in the future. As women sometimes have ovariectomies at a much younger age than our subject was, it is quite possible that even sixty years of survival may yet be reached.

It will be of interest here to take a retrospective view of the progress made in ovarian exsection during the thirty-four years of its performance prior to the operation of Dr. Atlee, in 1843. Up to that time no one had operated more frequently, or with better success, than its originator, who had made eleven *completed* exsections, and saved eight women. In a special record, prepared with much labor, covering the period named, and from which I have excluded all incomplete operations, I have collected in order 44 cases, 29 of which recovered, or 66 per cent., a little better general average than was attained in later years for a long period. Could Dr. Atlee have known all that we know now about this record, he would have felt still more hopeful as to an anticipated cure.

In the early days of ovarian exsection there were many operations that were not brought to completion, and in cases prior to that of Dr. Atlee,

where both ovaries were found diseased, it was the common practice to remove only the one which was most developed. His was a peculiar case, as the dropsy was not ovarian, and the cysts of the two organs were in an undeveloped stage. We have not been able to find any instance of a double ovariectomy prior to his operation.

COMPLETED OVARIECTOMIES PRIOR TO THAT OF JUNE 29, 1843.

No.	Date.	Operator.	Age	Locality.	Result.	Cause of death.
1	Dec. 13, 1809	Dr. Ephm. McDowell.	47	Danville, Ky.	Recov.	
2	May, 1816	" "	"	" "	"	
3	April 1, 1817	" "	"	" "	"	
4	May 11, 1819	" "	"	" "	Died.	
5	May 16, 1819	Dr. Chrysmar.	47	Isny, Wurtemberg.	"	
6	"	Dr. Ephm. McDowell.	"	Danville, Ky.	Recov.	
7	"	" "	"	" "	"	
8	June, 1820	Dr. Chrysmar.	38	Isny, Wurtemberg.	"	
9	Aug., 1820	" "	38	" "	Died.	
10	July 5, 1821	Dr. Nathan Smith.	33	New Haven, Conn. (At Norwich, Vt.)	Recov.	
11	July, 1822	Dr. Ephm. McDowell.	"	Danville, Ky.	"	
12	May 12, 1823	" "	"	" "	"	
13	May 23, 1823	Dr. Alban G. Smith.	39	" "	"	
14	"	Dr. Ephm. McDowell.	"	" "	Died.	
15	"	" "	"	" "	Recov.	
16	"	" "	"	" "	Died.	
17	Feb. 27, 1825	Mr. John Lizars.	36	Edinburgh.	Recov.	
18	Mar. 22, 1825	" "	"	" "	Died.	In 56 hours, of peritonitis.
19	.....	Dr. Ehrharstein.	31	Germany.	Recov.	
20	Sept. 14, 1829	Dr. David L. Rogers.	20	New York.	"	
21	Nov., 1830	Dr. John C. Warren.	40	Boston.	Died.	Hemorrhage from slipping of the ligature
22	1832	Dr. Ritter.	31	Germany.	Recov.	
23	1834	Dr. Groth.	"	Schönmoor, Germany.	Died.	In 16 hours, from hemorrhage.
24	Nov. 18, 1834	Dr. C. F. Quittenbaum.	"	Rostock, Germany.	Recov.	
25	Dec. 23, 1835	Dr. John Bellinger.	35	Charleston, S. C.	"	
26	May 8, 1836	Mr. Wm. Jeaffresou.	"	Framlingham, Eng.	"	
27	1836	Dr. Janson.	"	Frankfort, Germany.	Died.	
28	July 12, 1836	Mr. R. C. King.	"	Suffolk, Eng.	Recov.	
29	Sept. 27, 1836	Dr. Dohlhoff.	23	Magdeberg, Ger.	Died.	In 60 hours, general peritonitis.
30	Nov. 2, 1837	Mr. W. J. West.	45	Tunbridge Wells, Eng.	Recov.	
31	1838	Dr. Crisp.	"	Suffolk, Eng.	"	
32	1838	Dr. Schott.	"	Frankfort, Ger.	Died.	
33	1839	Mr. W. J. West.	"	Tunbridge Wells, Eng.	Recov.	
34	Sept. 9, 1840	Mr. Benj. Phillips	23	London.	Died.	
35	April 30, 1841	Dr. Stilling.	22	Kassel, Ger.	"	In 3 days, from hemorrhage.
36	1841	Dr. Hayny.	"	Junghenzlau, Ger.	"	In 6 weeks.
37	Sept. 12, 1842	Dr. Charles Clay.	46	Manchester.	Recov.	
38	Oct. 7, 1842	" "	57	" "	"	
39	Nov. 6, 1842	Dr. D. H. Walne.	58	London	"	
40	Nov. 8, 1842	Dr. Charles Clay.	39	Manchester.	"	
41	1842	Dr. C. F. Quittenbaum.	"	Rostock, Ger.	"	
42	Mar. 10, 1843	Dr. Charles Clay.	35	Manchester.	Died.	In 27 hours, hemorrhage from pedicle.
43	May 29, 1843	Dr. D. Henry Walne.	57	London	Recov.	
44	June 29, 1843	Dr. Frederick Bird.	35	"	"	

Recovered, 29; Died, 15.

Of the 44 exsections noted, only 16 belonged to the United States, and these were performed by six operators, who saved 12 women, or 75 per cent. They were: Drs. Ephraim McDowell, of Danville, Ky. (11); Nathan Smith, of New Haven (1); Alban G. Smith, also of Danville

(1); David L. Rogers, of New York (1); John C. Warren, of Boston (1), and John Bellinger, of Charleston, S. C. (1). Of the 28 foreign operations, England had a credit of 13, with 11 recoveries; Germany of 13, with 5 recoveries, and Scotland of 2 cases, of which 1 recovered.

Mr. Charles Clay, of Manchester, England, was the second to become famous as a special operator, and through him a decided impetus was given to the method of cure in his own country. He commenced to operate in September, 1842, and had 5 cases, with 4 recoveries, before Dr. John L. Atlee commenced. Mr. Clay was an advocate of the long incision, and lost 6 out of 10 cases under it in 1843; while Dr. D. H. Walne, of London, who operated by the short incision, saved 4 out of 5 in the same year. Mr. Clay did better subsequently, as he saved 12 out of his first 20, and 26 out of 40, or 60 and 65 per cent. respectively, which we should think a high rate of mortality now, when reduction in death-rates is the special claim of surgery.

The introduction of anæsthesia and antiseptics revolutionized the whole domain of abdominal surgery, and had a marked effect upon operations for the exsection of ovarian cystomata, which it was found could be removed with improved advantage through a very small opening; and the advocates of the long incision were obliged to change their views and adopt the more simple method. Gradually the mortality was reduced until Dr. Thomas Keith, of Edinburgh, was enabled to save 73 women in order, and to operate 100 times with only 3 deaths.

Dr. John L. Atlee was a general practitioner of medicine, surgery, and obstetrics; was not in any sense a specialist; and was by no means fond of using his knife, although sometimes derisively denominated "an old belly-ripper," as he once informed me. In his report of the case of Miss R., when he was just entering upon his career as an ovariectomist, he wrote as follows: "No one can be more disposed than myself to condemn the rash or wanton use of the knife which we see frequently exhibited. True, surgery would endeavor to banish it if possible from the list of remedies; and by a faithful application of such means as observation and experience have proved capable of exerting an influence upon the various functions of the body, endeavor to control its morbid states, and restore its primitive integrity. Unhappily this is not possible; our means are still too limited; resort must be had to the knife, and the case above detailed proves its efficiency and safety."

Dr. Atlee was the beau-ideal of a country doctor, socially, morally, and mentally. Besides attending to a large medical practice, he delivered 3254 cases of labor, performed 2000 surgical operations, and exsected 80 ovarian tumors in his sixty-four years of practice. In the year in which he became eighty-four years old he attended 5 obstetrical cases; and performed 7 ovariectomies, of which he lost the last one, through the careless act of a country doctor who assisted him. He had

twelve sponges in use; the assistant cut one in two without his knowing it and handed him a half, which he left in the abdominal cavity, as the count still showed twelve sponges. The patient, the only one of the seven, died of tetanus, and the sponge was found on autopsy. Dr. Atlee would no longer perform this character of exsection. His last surgical work was a tracheotomy, performed three weeks before his death, and when within two months of the age of eighty-six. He continued his professional labors until attacked by pneumonia from exposure to cold and dampness, and then died in three days.

Dr. Ehler, the only surviving witness of Dr. J. L. Atlee's first ovarian exsection, wrote to this effect, on September 1, 1893. Dr. Atlee being asked the day before the operation in regard to its risks and responsibilities, in view of the prevalent opinions current among medical men, said: "*I know every step in the operation, and I intend to perform it, hoping and believing in ultimate success, fearing no man's sayings or doings.*" The patient's preparation for enduring the operation was the administration of two tablespoonfuls of brandy and 20 drops of McMunn's elixir of opium (tinct. opii deodorata), of the same strength as laudanum. This may have given a little alcoholic courage to the lady, but was only a *placebo* in its antagonism to pain. It is difficult now to determine, which exhibited the greater degree of boldness, the operator or the subject. Before the days of anæsthetics, it was determined that the most painful steps in surgery were the cutting of the skin and nerves; and the long incision in the abdomen felt like the burning of a white-hot wire. In evidence, notice how soon a woman will double herself up, if you begin an abdominal section before she is fully under an anæsthetic sleep.

We are glad of this opportunity to pay a merited posthumous honor to a worthy medical practitioner who was satisfied to accomplish great good in saving life and relieving suffering in the region where he was born. The well-known name of "Atlee" has so generally been associated with that of his younger brother Washington, the specialist in ovarian exsection, who removed 387 ovarian tumors during his shorter life, that we are glad to make it known that there was another distinguished physician of the same name and family, not so widely celebrated, but much beloved and esteemed by those who were associated with him.

The patient says of herself, that when she had decided to submit to the operation, the whole town could not have persuaded her to change her determination, as she had unlimited confidence in Dr. Atlee. The day chosen for the operation proved to be a very warm one; she took a bath in preparation; a cup of coffee only for breakfast; and declined to be placed under the effects of ether. The operation was commenced soon after eleven o'clock A.M., and lasted forty-five minutes. As she

was alive to every sensation, she particularly refers to the process of breaking up the adhesions of the right tumor, which she says were five, and the separation of which caused an indescribable measure of suffering.

In her after-treatment, she says that she had a doctor, or a student of medicine with her, night and day for several days, and thinks they felt her pulse every half-hour. She remembers being permitted to walk once across her room at the completion of two weeks; and taking a ride of two miles, a week later. She expressed to me in writing, a loving gratitude to Dr. Atlee for his faithful care and attention as her physician, and for his skill as the instrument in restoring her to perfect health. She has led a busy life for half a century, and is described as still "active and sprightly."

329 SOUTH TWELFTH ST., PHILADELPHIA,
November 14, 1893.

A CONTRIBUTION TO OUR KNOWLEDGE OF EPIDEMIC CEREBRO-SPINAL MENINGITIS.

By SIMON FLEXNER, M.D.,
ASSOCIATE IN PATHOLOGY,

AND

LEWELLYS F. BARKER, M.B.,
FELLOW IN PATHOLOGY, JOHNS HOPKINS UNIVERSITY, BALTIMORE.

(From the Pathological Laboratory of the Johns Hopkins University and Hospital.)

(Concluded from page 172.)

SYMPTOMATOLOGY.

REGARDING the symptomatology, we shall content ourselves with giving a very brief *résumé* of the notes taken, paying most attention to the symptoms most prominent in this epidemic. We shall lay especial stress upon certain of the clinical features (*e. g.*, the blood examination) which heretofore have been insufficiently studied. The peculiar conditions which obtain in an infectious intra-cranial disease are such as to render the clinical picture very complex. In local infections elsewhere in the body (*e. g.*, pneumonia, diphtheria) it is comparatively easy to separate clinically the symptoms and physical signs due to the local action of the infectious agent on the one hand from those dependent for their origin on the absorption and distant action of its toxic products. In diseases within the skull, however, more than anywhere else in the body, it is the size of the pathological new production and the quickness of its development which are of significance for the severity and course of the disease. Quincke has recently again emphasized the fact that even the simple serous accumulations within the skull-cavity, no matter where

they are situated, if sufficiently extensive, may produce the most severe symptoms, or even cause death.

In epidemic cerebro-spinal meningitis we have to think of the results which may follow, not only the more or less sudden outpouring of an exudate (cortical, basal, or intra-ventricular), but also those which are consequent upon the direct and remote action of the toxins which are produced by the micro-organisms, and we have to decide whether the lesions in distant organs (lungs, heart, joints) are to be looked upon as absorption-effects or as a localization of the same organism in these parts, or as complicating infections due to other bacteria. As Leyden has pointed out, the gravity lies more often in the evil effects of the exudation on the functions of the brain than in the severity of the infection; if the meningitis be cortical, epileptiform convulsions endanger life; if there be marked exudation into the ventricles, then coma and brain paralysis too often ensue.

From what we have said, and from the results of pathological examinations, the complexity of the question becomes easily evident, and an attempt to analyze the different disturbances in function, and to connect each definitely with its pathological basis would seem at first to be well nigh hopeless. Nevertheless, with the constant acquisition of facts and better methods of technique, we need not despair of finally arriving at a position in which we shall be able to cope more or less successfully with these problems.

It was possible at Lonaconing to make out most of the different types of the affection which have been described—fulminating, acute, subacute, intermittent, and abortive. The onset of the disease was, in the majority of the cases, sudden, the individual being attacked without warning with severe headache and vomiting, symptoms which were often followed in a few hours by delirium, stiffness and retraction of the neck, and severe constitutional disturbances. In only a few cases was there a definite recognizable prodromal stage, with general malaise, headache, and dragging pains in the limbs.

Compared with other epidemics, the number of fulminating cases (*cas foudroyants*) was large, no less than ten patients dying within forty eight hours after seizure, one child indeed succumbing in eight and another in ten hours after the appearance of the first symptoms. In the less violent but still severe cases the symptoms lasted from six to fourteen days, when either death occurred or signs of slow improvement ensued. Many abortive cases were observed in which, after a sudden onset, with perhaps severe symptoms, the patients recovered with striking rapidity.

Several cases of the "intermittent type" occurred during this epidemic, and in these periods of comparative well-being alternated with marked exacerbations. The convalescence was often tedious, and the danger was by no means over when the acute symptoms had subsided.

Even after there was good reason to believe that the causative bacteria were all dead and convalescence seemed to be established, serious symptoms would reappear, which would suggest that as long as the exudate is not completely reabsorbed there is danger.

The symptoms in general, we may say, presented no regularity. The disease is full of surprises, and the clinical phenomena of one day or hour may differ greatly from those of the next.

Especially inconstant was the course of the fever, and the temperature charts are interesting, chiefly in that they show that no fixed type of pyrexia can be definitely assigned to this disease. Nor did the height of the fever bear any relation to the severity of the other symptoms; the sudden and often marked elevations and depressions of the temperature independent of general symptoms could be explained only by assuming a direct interference with the functions of the thermo-regulatory centres. Even the absence of pyrexia did not permit the making of a favorable prognosis.

The other symptoms referable to disturbances of the central nervous system, the headache, the vertigo, the delirium, the paralysis of the eye-muscles, the deafness, the general hyperæsthesia, and the twitchings showed almost as great irregularity as did the temperature curve.

Among the clinical appearances noted which were due to lesions of the cranial nerves and their centres in the different cases may be mentioned anosmia, strabismus (almost always divergent), nystagmus (usually horizontal or vertical), inequality of pupils, photophobia, ptosis, defects of vision, facial rigidity, trismus, slowed respiration, Cheyne-Stokes breathing, deafness and disturbances of speech.

On account of its rarity, it is interesting to record one case in which we observed definite rotary nystagmus. The patient was a girl of seventeen, who had severe general symptoms with distinct evidence of a basal exudate. During a part of one day the left eyeball was rotated definitely in its socket, the excursions apparently corresponding to the limits of the movements of rotation. On reviewing the literature, we have been able to find reference to only one similar instance—a case mentioned by Jaffé.

The intra ocular changes have been especially studied in this epidemic by Dr. R. L. Randolph. Out of thirty-five cases in which he examined the fundus, it was normal only in seven. The most frequent alteration was passive congestion in the retinal veins, with congestion of the optic disks. In several cases there was a distinct optic neuritis, and in one instance the central vein was thrombosed.

The retraction of the neck was very commonly present; in some cases the occiput was drawn well back between the scapulæ. The thighs and legs were frequently flexed, but extreme opisthotonos was not often seen. There was general hyperæsthesia of the skin, and attempts to change the

position of a patient gave rise to severe pain. In the graver cases there were marked twitchings of the muscles and tendons, and in some, especially a short time before death, convulsions and coma.

The tendon reflexes varied much, but in many cases were diminished, which is to be attributed, no doubt, to the extent of the interference with the posterior roots of the spinal nerves.

Beyond the nervous arhythmia, the respiratory organs were not markedly implicated, and it was only rarely that one met with an associated bronchitis or broncho-pneumonia. General cyanosis was not uncommon. A very frequent feature in the epidemic was epistaxis, a symptom which does not seem to have often attracted the attention of observers elsewhere.

The pulse was sometimes slowed, sometimes accelerated, and often intermittent. Beyond the blowing systolic murmurs so frequently heard over the cardiac area in children in febrile affections, there were very few symptoms referable to the heart or pericardium.

The lips, teeth, and tongue were covered with sordes, especially in the graver and more protracted cases. A few patients showed mild anginas, and the tonsillar crypts were not infrequently filled with white cheesy-looking plugs. The chief symptom pertaining to the digestive system was the vomiting, which, in some cases, was persistent and intractable, leading to inanition and emaciation. Where the retraction of the neck was great there was often difficulty in swallowing; in some cases the dysphagia appeared to be due to interference with the normal innervation. The bowels were, as a rule, constipated, although diarrhœa occasionally occurred. Indeed, in four cases a well-marked dysentery was observed, the feces containing mucus, pus, and blood. Occasionally in a grave case there would be incontinence both of the urine and the feces.

In one case of dysentery the feces were carefully examined. The reaction was found to be alkaline, the odor very foul, and mucus, pus, and blood were visible to the naked eye. A fresh specimen of the mucopurulent portion, examined microscopically, showed, besides the epithelium from the surface of the mucous membrane, many round cells of variable size, which were often fatty and vacuolated. Some of these were certainly polynuclear leucocytes, others resembled rather lymphoid cells. In the protoplasm of several cells which had the size of polynuclear leucocytes, besides large vacuoles, one could make out single included cells of small size. Red blood-corpuscles were also present. Smear cover-glass preparations, dried and stained in various ways, showed as the predominating organism lancet-shaped cocci in pairs, apparently encapsulated. In addition, there were slender bacilli, a few shorter, thicker bacilli (resembling *B. coli communis*), and short chains of streptococci. It must be mentioned that in the two cases which came

to autopsy large lumbricoid worms were found in the alimentary canal, and, on inquiry, we learned that they had been observed in many of the cases, both in the vomit and in the feces.

The spleen was at times slightly enlarged, as shown by percussion; the splenic dulness, however, did not pass beyond the costo-articular line, and in no instance was the border of this organ palpated. Abdominal retraction was not a prominent symptom on the whole. The only symptom referable to the liver was the occurrence of mild jaundice in two of the cases.

The cutaneous changes were widely divergent. Many of the cases ran their course without any apparent exanthem, and if one were to be guided only by the majority of cases in this epidemic he would be compelled to discard the name "spotted fever" for the disease. Herpes was very common, and formed an early and important symptom. It was situated chiefly on the lips, nose, ears, and neck following the distribution of the cutaneous vessels and nerves. Purpuric and petechial eruptions were seen in a comparatively small proportion of the patients; one of the commonest forms of eruptions was an indistinct purplish mottling over the surface of the body, which appeared and disappeared almost under the eyes.

The urine varied in amount in different cases and in different stages of the disease. As a rule it was concentrated, but occasionally a patient would pass large quantities having a low specific gravity. In the severer cases, and especially in those running an acute course with high fever, slight albuminuria was common, and microscopical examination of the sediment showed the presence of hyaline and granular casts. Ehrlich's diazo-reaction was negative in every case in which it was applied. The reaction has, however, been present in the urine in a few instances in meningitis, but only according to Ehrlich in very severe cases. The urine contained an excess of phosphates, a point to which several observers, notably v. Grimm, have called attention. In many cases there was a white precipitate of triple phosphates equal to one third or more of the volume of urine passed. In none of the specimens examined could the presence of sugar be demonstrated.

THE JOINTS.—Nearly twenty per cent. of the severe cases suffered from complicating joint affections, the knees being most frequently attacked, the elbows, wrist, and ankle following in frequency in the order named. The effusions were peri-articular as well as intra-articular, and the joints were swollen and reddened, resembling closely those of acute articular rheumatism. Indeed, there were cases which, had it not been for certain initial symptoms indicating a meningeal process, could easily have been diagnosed as nothing more than attacks of rheumatism. Similar cases have been noted in other epidemics, and there are references in the literature which draw attention to the prevalence

of meningitis and of rheumatism in the same community at the same time.¹

Speaking generally, it may be said that for this epidemic at least, complications in the joints occurred more frequently in the better class of patients, and it is interesting to note that the meningeal symptoms appeared to be favorably influenced by their appearance.

Kernig, of St. Petersburg, has described a symptom which he believes to be pathognomonic of meningitis. In thirteen cases he observed a peculiar flexion contracture (*Beuge-kontraktur*) of the knee-joints which could not be reduced when the patient was in the sitting position. In attempting to extend the knee, the leg could not be straightened further than a point where it made an angle of about 135° with the thigh, although when lying or standing this contracture was completely absent. If the patient lay on his side with the thighs drawn up the symptom was still present. It has been claimed that the same phenomena may be seen in many other conditions (old age, chronic alcoholism, etc.), but Kernig asserts that he has examined thousands of individuals with particular reference to this point, and has never found this contracture except in cases of meningitis. Unfortunately we were not familiar with this suggestion when at Lonaconing, and so cannot say anything as to the value of "Kernig's symptom."

THE CONDITION OF THE BLOOD.—There have been very few opportunities for studying the blood in cases of epidemic cerebro-spinal meningitis since the more general employment of the finer methods of hæmatological technique; and in the literature we have been able to find only meagre references to the subject by Halla, v. Limbeck, and Rieder. The two former found a leucocytosis in cases of suppurative meningitis, while Rieder observed two cases of epidemic cerebro-spinal meningitis, one having 20,100 white corpuscles, the other 17,500 to the cubic millimetre. We were fortunately able to examine the blood of

¹ These facts are, we think, not without importance as bearing upon the etiology of acute rheumatism. There can be little doubt, it seems to us, although for the proof we must look to cultural experiments, that in the joint complications in epidemic meningitis, the articular and the peri-articular inflammations are due to local infections with the same bacterium which has set up the meningitis. Moreover, in at least one case of genuine acute rheumatism the micrococcus lanceolatus has been isolated in pure culture from the joint effusion, and Fda and Bordoni-Uffreduzzi have been able to set up a polyarthritis in rabbits by subcutaneous inoculation of this diplococcus. The frequent association of rheumatism with endocarditis, and with inflammation of the pleura, pericardium, and peritoneum lend support to the view that at any rate in a certain proportion of the cases the pneumococcus may be the cause. Nevertheless it is probable that acute articular rheumatism will, ere long, be proven to have no etiological unity, just as has already been proven for the inflammations of the serous membranes generally. It seems probable that the entrance of pyogenic organisms of different varieties into the circulation, under circumstances which are inconsistent with the development of the phenomena of a general septicæmia, may give rise to inflammations in some one or more of the serous membranes of the body—be it meninges, pleura, pericardium, peritoneum, or joint surface, the particular ones attacked depending on certain peculiarities either in the virulence of the invading organism or in the lessened resistance at the moment of the serous membrane implicated.

several of the cases at Lonaconing, but shall include in this report only a few typical examples.

In order to avoid error, every precaution was taken in these examinations. The blood in all cases was taken with the aid of a sterile lancet from the lobule of the ear, previously thoroughly cleansed with alcohol and ether. The blood was examined fresh in each case, care being taken to secure specimens which spread out into a layer of only one corpuscle in thickness. These were examined immediately with an oil immersion lens. The hæmoglobin was estimated by the instrument of v. Fleischl. The readings were made in a dark room, with artificial light, and through a cylinder of paper some twelve inches in length. Moreover, the readings were made by two individuals, and where the results differed at all the mean of the readings was recorded. By this method of control any gross error was avoided. For the enumeration of the corpuscles the blood-counter of Thoma-Zeiss was employed, the methyl-violet solution of Toison being used as a diluting fluid. Finally coverslips were prepared for drying and staining by the methods of Ehrlich. For this purpose particular care was taken to secure good specimens, and on subsequent examination all imperfect preparations were discarded. We shall epitomize the results of our examinations. In the fresh blood slide no marked variations in size or shape of the red corpuscles could be made out; in some of the cases, however, there was distinct pallor of the red cells. The increase in the number of the leucocytes was quite evident in many cases in the examination of the fresh drop of blood, and a greater number of white corpuscles appeared to be motile than one sees under normal conditions. Many of the leucocytes presented a striking vacuolation, a condition which, we believe, is not uncommon in the leucocytes dependent on other causes. The blood-platelets were present in clumps, but did not appear to be decidedly increased or diminished in numbers.

As to the number of corpuscles present, the average of a number of counts shows that a diminution of the red cells is not a marked feature of the disease. In some of the advanced cases, with emaciation there was a moderate oligocythæmia, but in the majority of instances the full complement of red blood-corpuscles was present. The hæmoglobin, however, in all cases examined was somewhat diminished in amount, so that the individual corpuscular holding in hæmoglobin (*valeur globulaire*) was below par. A well-marked leucocytosis is, we believe, a constant phenomenon in the disease during its active stages. In no case examined, except in convalescent patients, was it absent. The number of white corpuscles varied in different cases in our experience, between 12,000 and 32,000 to the cubic millimetre. That the degree of variance is greater, however, there can be little doubt, and it is probable that further investigations will prove that still larger leucocytoses may exist, especially in cases of meningitis associated with complications in the lungs or joints. The dried specimens were fixed by heating for an hour and a half on a copper bar at 120° C., and then stained, some of them in solutions of eosin and methylene-blue, some in the triple stain of methylene-green, acid fuchsin and orange green.

In none of these specimens were micro-organisms found, although they were patiently looked for. The "color analysis" of the leucocytes

showed in every case the increased number of white blood-corpuscles to be due to an increase in the cells with neutrophilic granules and polymorphous nuclei. The mononuclear cells (small and large) were relatively diminished in number. It will be seen that these changes in the blood are not peculiar to meningitis, but are quite in accord with the leucocytoses associated with suppurative inflammations, or inflammations accompanied by well-marked local exudation anywhere in the body.

As examples the following four cases may be cited :

Bessie B. (Case XVII. of Dr. Porter's series), aged four years, always healthy before ; had been a bright, stout, well-nourished girl. One evening in the last week in January felt cold and chilly, and had distinct rigor during the night, followed by vomiting and severe pain in the head. During first week she was very restless, had muscular hyperæsthesia, inequality of pupils, rapid pulse, and uttered a sharp cry from time to time. Two purpuric spots appeared on buttocks. Retraction of the neck began about the eighth day. Up to this time the patient ate and drank well, and appeared rational. The mother now noted that the child could not use the right arm, and on examination it was found rigid and swollen. Herpetic eruption appeared about the tenth day.

Note dictated February 14: Child lies on left side, moderately emaciated, legs drawn up, thighs flexed, right arm rigid, resists movement ; head retracted ; whole body held stiff and rigid ; attempts to move the child cause her to cry out ; face slightly mottled and has a bluish tint ; lips bluish-red and covered with sordes ; remains of herpetiform eruption visible. Tongue grayish-yellow, moist coating thicker in the centre than at the edges ; pupils even, midway between contraction and dilatation. No ocular paralyses ; veins in forehead rather prominent ; thorax symmetrical ; expansion equal ; marked pulsation in vessels of neck ; resonance clear throughout front, axillæ, and back ; a few whistling rhonchi heard at bases. Pulse equal at the two wrists, 18 to the quarter, very irregular and arrhythmical. Sometimes there would be two or three beats of varying intensity followed by a pause corresponding to the time of from two to four beats ; volume of pulse rather small. Apex beat of heart in fourth interspace 1 cm. inside the left nipple line. Dulness not increased ; loud blowing systolic murmur heard over whole cardiac area, greatest intensity at the third left interspace 1 cm. from sternal margin. Pulmonic second sound relatively accentuated. Splenic dulness begins at the eighth rib and extends to the costal margin ; does not pass the costo-articular line. Border not palpable, possibly owing to rigidity of abdomen. Liver dulness begins at the seventh rib in right mamillary line and extends to costal margin ; border not palpable. Skin dry, no œdema ; no marked change in tendon reflexes ; no lymphatic enlargement.

The blood examination was made on February 14. Even in the fresh drop of blood the increase in the white elements could easily be made out. The count showed 4,448,000 red and 24,000 white blood-corpuscles ; hæmoglobin, 72 per cent. Dried and stained preparations showed a marked increase in the number of polynuclear leucocytes with ϵ -granules, and a relative diminution in the number of lymphocytes and large mononuclear leucocytes.

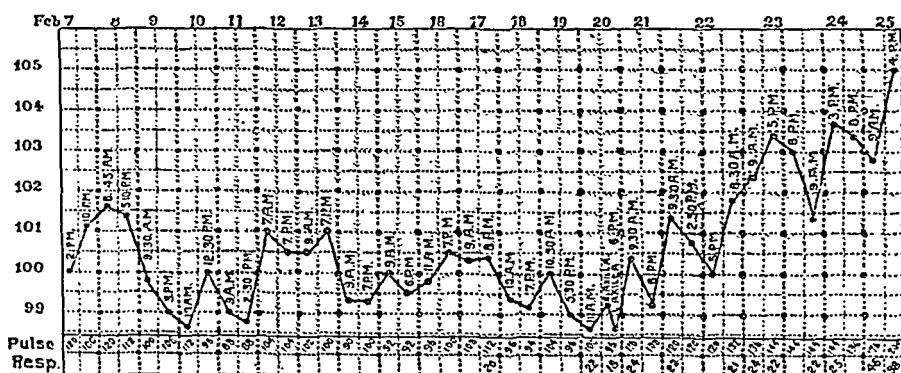
Florence D., aged sixteen years. The onset in this case had been gradual, the patient having pain in the head and back for several days before any serious symptoms appeared. On January 29, at 1 P.M., she had a severe chill followed by excruciating pain in the head, causing loud shrieks and restlessness ; this was associated with vomiting and excitement. Next day

the patient was decidedly deaf and more or less stupid. Later she became delirious, and often had to be held in bed. She picked her nose from time to time and had several attacks of epistaxis. Distinct purpuric eruption appeared on face and neck and a few spots on body. None of them were very bright and none of them turned yellow or green afterward. During part of her illness she had retention of urine and had to be catheterized. Her bowels were constipated. Spleen and liver not distinctly enlarged. The temperature never went higher than 103.5°. She had marked eye symptoms, including divergent squint, paralysis of accommodation, and nystagmus. On ophthalmoscopic examination there was a definite optic neuritis in the right eye (Dr. Randolph). The girl died at the end of the third week of the disease. Toward the end she was much cyanosed and showed well-marked Cheyne-Stokes respiration. Her urine was examined several times and found to contain a trace of albumin and numerous hyaline and granular casts.

The blood was examined on two successive days in the third week. As the results of the two examinations were practically the same, we give that made on February 15. In the fresh blood slide, the examination of two or three fields sufficed to show that the leucocytes were distinctly increased in number. The vacuolation of the leucocytes was especially striking in this case. Hæmoglobin (v. Fleischl), 45 per cent. Blood-count: red blood-corpuscles, 4,896,000; white blood corpuscles, 24,500. The dried and stained specimens showed a marked relative increase (over 85 per cent.) in the neutrophils with polymorphous nuclei, and a relative decrease in the different mononuclear forms. Several typical normoblasts seen.

Agnes S., aged nine years, taken ill on February 7, 1893. Complaining of chill, severe pain in the head, and vomiting. The temperature, as will

FIG. 4.



be seen by referring to the accompanying chart, was not high at the beginning. There was severe pain in the neck and inability to move muscles of limbs on account of pain. No marked retraction of neck. She continued with comparatively mild symptoms for some ten days when, on February 17, she had diarrhœa, cramp-like pains in the abdomen, with a little blood and mucus in the stools. These symptoms were relieved the next day, but on the 18th she suffered from extreme pain in left ear, requiring morphine for its relief. On the 20th it was noticed that she had no power in right arm and leg, and there was some incontinence of urine and feces. Paralysis of right side of face. On 23d temperature rose to 101.8°. Next day well-marked evidence of complicating bronchitis and broncho-pneumonia.

Pulse and respiration became more rapid and temperature higher. Death on evening of February 25. Temperature, 105°; pulse estimated at over 200.

The blood examination in this case was made on February 14th. In the fresh blood slide the increase in the white elements was easily demonstrable. Marked vacuolation of the leucocytes. Hæmoglobin (von Fleischl) 72 per cent. Blood-count, red blood-corpuscles 5,032,000; white corpuscles 29,500. Cover-glass preparations from this case dried and stained in the "triple stain," gave the following "differential count" of white elements:

		Per cent.	Proportions in normal blood.
			Per cent.
Small mononuclear	53	4.9	15 to 25
Large mononuclear and transition forms	74	6.8	4 to 6
Neutrophils with polymorphous nuclei	946	87.3	70 to 75
Eosinophiles	0	0.0	1 to 5
Myelocytes	10	1.0	
Total number counted	1093	100.0	

Only one nucleated red blood-corpuscle (typical normoblast) seen in the whole slide.

In making the differential counts it was thought best to adopt the simple classification given above rather than the more complicated one of Uskow. According to the suggestion of Thayer, we have made the counts so that the small mononuclear elements correspond to the small and large lymphocytes, the small transparent forms and some of the smaller transitional forms of Uskow; the large mononuclear and transition forms including all other non-granulated forms, with the exception of transparent polynuclear leucocytes. In terms of Uskow's classification the characteristic change in these leucocytoses consists of an increase in the *ripe*, and especially in the *over-ripe* elements with a relative decrease in the number of the *young* or *unripe* elements.

The complete absence of leucocytes with eosinophilic granules did not hold for the other cases examined. The number of typical myelocytes seen in this case was rather striking, and, had the patient been an adult, would perhaps have been of considerable pathological significance. In the blood of children, however, one often sees, even under normal conditions, a variable number (nearly always, however, under 1 per cent.) of these cells.

For comparison, we give the results of a differential color analysis of the blood taken from a woman, thirty-eight years of age, who had suffered from a prolonged attack of meningitis, and had a moderate leucocytosis:

	Per cent.
Small mononuclear elements	10.9
Large mononuclear and transition forms	2.1
Eosinophiles	0.6
Neutrophils with polymorphous nuclei	86.4
Myelocytes	0.0
	100.0

Lizzie L., aged fifteen years (service of Dr. Skilling), was seen during convalescence. She had suffered from a severe attack, the temperature at the beginning reaching nearly 105°. There had been retraction of the neck and delirium for some four or five days, and excessive vomiting. Abundant

herpetic eruption on lips, cheeks, hands, and wrists, the discoloration still remained. Marked constipation at first. No paralysis, no joint complications, no tenderness below neck. Had been sitting up the day before blood examination was made.

In the fresh blood-slide the red corpuscles were noticed to be distinctly paler than normal. No apparent increase in number of white elements. Hæmoglobin 55 per cent. Red blood-corpuscles, 5,004,000. White blood corpuscles, 9000. In the dried and stained specimens the different varieties of leucocytes were present in about normal proportions, the over-ripe (multinuclear) elements being still, however, slightly in excess. A few typical normoblasts seen. This count is given in that it shows the disappearance of the leucocytosis with the advent of convalescence.

TABLE.

Patient.	Age.	Attending physician.	Day of disease.	Temperature at time of examination.	Hæmoglobin (v. Fleischl).	Red blood-corpuscles to c.mm.	Valeur globulaire.	White blood-corpuscles to c.mm.	W. R.	Remarks.
B. B.	4	Dr. Porter	17th	...	p. ct. 74	4,448,000	0.84	24,000	1 : 185	Dysentery as a complication. Albumin and casts in urine.
F. D.	16	Dr. Porter	18th	101.2°	45	4,896,000	0.47	24,500	1 : 199	
A. S.	9	Dr. Porter	7th	100.5	72	5,032,000	0.7	29,500	1 : 170.	
L. L.	15	Dr. Skilling	...	99.2	55	5,004,000	0.55	9,000	1 : 556	Convalescent.

A word of explanation is necessary with regard to the low percentage of hæmoglobin found in the blood of Florence D. and Lizzie L. Both these girls showed clinically a decided pallor of the skin and mucous membranes, although as the blood-counts show the red corpuscles were present in nearly normal numbers. The marked diminution in the *valeur globulaire*, taken with the age and sex of the patients, made us think of a pre-existing chlorosis, and on inquiry we learned that both had been noticed to be slightly pale for some months previous, and that both had complained of more or less constipation and certain menstrual irregularities. It is almost certain, therefore, that the low percentage of hæmoglobin observed in these two cases was not entirely dependent upon the meningeal inflammation.

And finally, in this connection, it will not be out of place, in view of the many interesting observations which have been made regarding the bearing of the presence or absence of a leucocytosis in diseases due to the lanceolate diplococci (acute lobar pneumonia, pneumococcus-infections in rabbits) upon the severity of a given infection and upon the prognosis, to state that, in the fatal cases which we have had the opportunity of examining during life the presence of a leucocytosis was always demonstrable. While for confirmation of this point it will be necessary to study many more cases in future epidemics, yet the evidence, as far as it goes, is in favor of the view which we have already mentioned, that death

in cerebro-spinal meningitis results from the local intra-cranial mischief, rather than from the infection *per se*.

The death-rate at Lonaconing corresponded to that of an epidemic of moderate severity, about 40 per cent. of the cases (excluding those classed as abortive) proving fatal. Hirsch, in his monograph, states that out of 15,632 cases 37 per cent. died. v. Ziemssen placed the mortality of mild epidemics at 20 per cent., and of the severest epidemics at 70 per cent.

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The disease, then, being known to be due, at least in the majority of instances, to the action of a specific micro-organism, viz., the micrococcus lanceolatus, we have next to consider by what mode the infectious agent gains entrance to the body, and more particularly into the meninges of the brain and cord, and in what way, if at all, it is thrown off. Again we have to inquire whether, if it can be thrown off, it will ever then be in a condition to infect other individuals.

Unfortunately a wholly satisfactory answer cannot at this time be given to these questions. We are not yet in possession of sufficient data based on a close study of the epidemiology and bacteriology of the disease, to enable us to more than indicate the probable mode of infection and the conditions which predispose to the origin and propagation of the disease.

The simultaneous prevalence of other infectious diseases in the localities in which epidemic cerebro-spinal meningitis existed, has been held to be of some significance. The occurrence of pneumonia at such times must be regarded as of special importance, for, as we have said, the same infectious agent is the cause of both diseases, and in the epidemic of cerebro-spinal meningitis studied by Foà and Bordoni-Uffreduzzi the most of the cases were complicated by pneumonia. Epidemic parotitis has been noted as occurring in a community in connection with or just before the outbreak of this disease. Parotitis was epidemic at Lonaconing at the time of the prevalence of meningitis, and we may remark that there are in the literature references which go to show that the micrococcus lanceolatus may be the cause of this disease also.

Again, other infectious diseases, scarlet fever, measles, typhoid fever, influenza, and coryza, have been mentioned by different writers as concomitant epidemics.

While in pneumonia, and probably a certain number of cases of parotitis and coryza, the same organism as that found in meningitis is known to occur, yet in the other infectious diseases mentioned, the infectious agent, so far at least as is known at present, is in none of them the micrococcus lanceolatus. Moreover, it is to be remembered that meningitis does not attack by preference those suffering or just recovering from other infectious diseases, if we exclude pneumonia. These diseases occur as concomitants or as precursors only.

Hence it is clear that in the search for predisposing factors we must look further than the infectious diseases with which epidemic meningitis may coexist. And it is not improbable that we shall find that, although one disease does not depend upon the other for its development, yet the same conditions of life which permit one to flourish may also engender the other.

It has been suggested by Strümpell that there may be some relation between coryza and epidemic meningitis. This, he thinks probable, on account of the observations of Weigert, that in some cases of the disease there is a purulent inflammation of the nasal sinuses. Weichselbaum found in some of his cases of meningitis purulent inflammation of the nasal and sphenoidal sinuses and the middle ear, and in all these he demonstrated diplococci. One must, we think, hesitate before accepting it as even highly probable that the majority of cases originate in this way. On the other hand, a sharp line of distinction must be drawn between those cases which are definitely primary and those which are secondary. There are, undoubtedly, cases in which there has been an extension of disease in the middle ear to the meninges, and why should not the same thing happen in diseases of the nasal sinuses? Such cases may simulate the sporadic form of the disease. But what is necessary is to see whether or not cases associated with diseases of the middle ear and those of the nasal mucous membrane occur in such numbers during an epidemic as to make this mode of origin the probable one in all. In the acute case in which we performed an autopsy no disease of the nasal sinuses existed.

With our present knowledge it seems more probable that we have to do with an infection by the way of the blood current rather than by continuity from the nose or ear. The common occurrence of meningitis in pneumonia indicates the possibility as well as the frequency of this mode of infection. In those cases in which pneumonia does not occur, other sources of entrance for the infectious agent must be sought; and to this category belongs especially the epidemic form. In any consideration of this subject at the present time, infection from the nasal¹ and oral cavities, in the latter case by lymphatic communication, as suggested by Ortmann, is a possibility which cannot safely be rejected. Nevertheless, the writers have been led to believe that the intestinal tract may be regarded as the way of entrance into the blood-current, if not in all, at least in many of the cases.

In two of the cases which we observed clinically, and which afterward proved fatal, there was dysentery. Cultures and cover-slip preparations were made from the evacuations of one of these, and the predominating

¹ The lymphatics of the mucous membrane of the nose can be injected from the sub-arachnoidal lymph space (Schwalbe, Key, and Retzius.)

organism present was the micrococcus lanceolatus. In both of the cases which came to autopsy there was enteritis. And in other epidemics the occurrence of dysentery has been noted. Yet constipation as a feature of the disease is of more common occurrence than diarrhœa. This may be considered at first as militating against the conception of the intestinal tract as the place of entrance into the body of the infectious agent. But it is perfectly conceivable that the organisms may enter through the intestinal canal without first producing a demonstrable lesion therein, and find in the meninges of the central nervous system a *locus minoris resistentiæ*. The case of meningitis, as reported by Ortmann as due to the micrococcus lanceolatus secondary to typhoid fever is important as indicating the possibility of entrance from the intestine. Here, however, undoubted lesions of the mucous membrane were present.

Owing to the slight vitality of the organism in acid media, and as the intestine must become invaded after the infectious material has first passed through the stomach, it is necessary to draw attention to one point that may be of significance. Whether in all the persons attacked there is an alteration in the gastric juice by which its acidity is either diminished or altogether abolished, we cannot say, as we were unable to obtain the contents of the stomach from a number of cases. But in the vomit obtained from one child sick of the disease, free hydrochloric acid was demonstrated to be absent. Still, were this not the rule, there are periods in health during the fasting hours, when the stomach is free, or nearly so, from acid contents. In this connection the observations of Ewald are full of interest. He found that when water was introduced into the stomach a small amount passed immediately into the intestine; after about an hour the rest went suddenly over into the duodenum, and this part had no acid reaction, so that any bacteria present were not subjected to the harmful influence of an acid medium. Flügge has recently emphasized this point when dealing with the method of spread of cholera through drinking-water. In our disease the diplococci are of course not necessarily in the water imbibed, but in the process of swallowing it is easy to understand how they could be washed from the mouth and throat (their constant habitat), and so gain entrance to the stomach, and finally to the intestines uninjured.

The importance of considering the intestine as a probable infection-atrrium in epidemic cerebro-spinal meningitis becomes evident when it is remembered that about 80 per cent., and according to some authors (Kruse and Pansini) 100 per cent., of all persons in health carry about constantly in their mouths the micrococcus lanceolatus, and according to Netter, in 20 per cent. of these the organisms possess sufficient virulence to kill animals when injected into them. This fact removes the necessity of searching for the infectious agent outside the body, in, for example, the soil or the water.

Most writers on the subject now agree that the disease is not contagious, but is rather of "miasmatic" origin. The localization of the infectious agent in the closed cavity of the central nervous system certainly does not favor the infection of the surroundings. Still in some epidemics, that in Hamburg for example, the disease was known to appear in a locality in which it previously existed, but from which it had disappeared; and the interval of time which had elapsed was in some instances considerable. These facts would seem at first to be irreconcilable with the view that there is no infection of locality. We have shown that an organism possessing the culture and morphological properties of the micrococcus lanceolatus is thrown off with the dejections in some cases of cerebro-spinal meningitis, and as indicated by the experiments of Bordoni-Uffreduzzi, Guarnieri, Netter, Patella, Nikiforoff, Sirena, and Alessi, and Kruse and Pansini, the organisms may retain their vitality and even virulence when dried in sputum, blood, etc., sometimes for four months. Hence we are not at this time justified in excluding the possibility of the infection of locality. This assumption seems, however, in view of the wide distribution of the organism in nature, to be hardly necessary. It is, we think, more probable, that the local conditions which enabled the first cases to appear, persisting, other susceptible individuals are attacked, so that fresh cases appear in the site of the previous ones, in fact that we have to do with a "predisposition of community" rather than an "infection of locality."

If we are then to believe that the disease is, in the majority of instances, the result of an auto-infection, and this would be equally true whether we conceive it to be due to the entrance of the bacteria from the nose or pharynx or from the intestinal canal, it still remains for us to determine the nature of the unusual conditions which render the system vulnerable to the invasion of the micro-organism, and what it is that brings about the localization by preference of the morbid process in the cerebro-spinal meninges.

When excluding air, water, soil and food, as carriers of the infectious agent, we by no means intend to deny that they may play an important rôle in the causation of the disease. And concerning Lonaconing, the local conditions are such as would naturally produce a lessening of the powers of resistance of a number of individuals, and thus render them, although apparently in good health, susceptible to the disease. While in this epidemic, as we have already said, the more prosperous classes were by no means exempt, it was chiefly the poor that suffered, and the disease prevailed particularly in localities in which the houses were close together, and in which overcrowding existed, with the attendant evils of unsanitary arrangements, improper and insufficient food, and unclean bedding and clothing.

Nevertheless, although the facts pointed to a predisposition of the

whole community outside the merely personal predisposition, in the end the resistance of the tissues of each individual must necessarily be of prime importance in determining infection or immunity.

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THE TIMES AND MODES OF THE INTRODUCTION OF THE EXOTIC DISEASES OF CHILDREN INTO AMERICA.¹

BY J. LEWIS SMITH, M.D.

THE tribes of American Indians occupying North and South America, left to themselves, have never, so far as I am aware, made any important or effective effort to improve their condition. When the Europeans discovered America the chief endeavor of the Indian was to obtain shelter from the weather by rudely constructed huts, to appease hunger by vegetables of spontaneous growth, or by the products of hunting and fishing, and to repel the encroachments of neighboring warlike tribes by implements scarcely better than those of the stone age. Their diseases were chiefly such as are due to climactic influences, such as pertain to the normal growth and decay of the body and to the disturbance of its functions.

The medical literature of America, at least that of North America and in the English tongue, was very meagre during the two centuries succeeding the discovery of America. But there is, I think, sufficient historical evidence that the highly contagious and fatal diseases of infancy and childhood, which to a great degree check the increase of population in both hemispheres, were unknown to the American Indian until communicated by the European.

First we will consider those two loathsome diseases² of a vicious and dissolute life, diseases which now prevail among the profligate in all countries reached by commerce and travel. These two diseases were not differentiated from each other until long after the discovery of America. Though described in text-books as diseases of adults, they not infrequently affect children in one way or another. Inherited syphilis is likely to be fatal in infancy unless properly treated, and in those who survive it is a common cause of scrofula or deterioration of

¹ Address at the opening of the Pediatric Section of the Pan-American Medical Congress.

² Syphilis and gonorrhoea.

constitution. The Indian, at least in North America possesses, in his normal state, a vigorous constitution and great power of endurance; but broken down by inherited disease and a dissolute mode of life, his system becomes frail, much less capable of endurance, and he is liable to an early death.

The second of the diseases which we are considering, gonorrhœa, is a serious infliction upon a people having no medical profession or science of medicine. It is likely to produce a severe specific conjunctivitis, with subsequent blindness and other ailments in young children, besides deterioration of the system.

Certain it is that the two maladies to which we call attention were not only not differentiated from each other, but had attracted but little attention on the part of the laity and physicians—probably on account of their rarity—until the last quarter of the fifteenth century. In the last decade of the fifteenth century the army of Charles VIII. of France had entered Spain and Italy in the vain attempt to establish a French empire extending from the Baltic to the Mediterranean, and bands of dissolute soldiers, roving through Southern Europe, disseminated the loathsome diseases of which we are treating. In the belief that they were forms of the same disease, they were designated the *morbus gallicus* in Italy and Spain, which countries suffered severely from the invasion of the French army. This term will, for convenience, be used in this paper to designate syphilis and gonorrhœa before they were differentiated. The *morbus gallicus* was so frequent in Southern Europe during the stay of the army of Charles in Italy, and especially at the siege of Naples, that it was regarded as an epidemic thought by some to be due to an unfavorable conjunction of the stars. The discovery of the Western hemisphere at this time, and the fact that the sailors and soldiers of Columbus had the *morbus gallicus*, also gave rise to the absurd and untenable theory that the diseases embraced under this name were communicated by the natives of the West Indies to the European navigators, when the reverse was true.

Francesco Delicado states that the *morbus gallicus*, with which he was familiar from sad personal experience, prevailed as early as 1448 in Rapallo, and he adds that it was conveyed to America by the men under Columbus (Baumler). He resided several years in Italy. Friedberg wrote in his interesting monograph that certain persons holding high positions in church and State, even those in the quiet of monastic life, presented lesions which we recognize as those of the *morbus gallicus*, in the decade preceding that of the discovery of America, and he quotes the following passage from the *Annales Danicæ* of 1483, nine years before the discovery of America: "*Morbus gallicus sævit christianos.*" R. Diaz de Isla, in a monograph written about 1510, states that he had treated the *morbus gallicus* in Barcelona before the

King of France invaded Italy, and also that he had treated the same disease in men from the caravels of Columbus. Did time permit we might quote other extracts from the writers of the fifteenth and sixteenth centuries, showing that the morbus gallicus was an Oriental disease, which gradually extended westward. Was it designed by Providence to expose and check degrading and immoral habits? But the innocent suffered with the guilty. The natives of the West Indies, at first regarding the strange beings who arrived in winged caravels as divine personages, were soon reduced to servitude by the lash and bloodhounds so as to work in the mines and perform other menial tasks, but their worst infliction was the reception of loathsome and fatal diseases, so that their aggregate population soon began to diminish.

Syphilis and gonorrhœa are both highly infectious, and we can easily understand how they were conveyed to continental America by expeditions like that of Cortez. It appears that they extended slowly through the temperate regions of North America, for John Hermann Bass, in his exhaustive treatise on the *American Indian States* (page 588), says that syphilis reached Boston in 1646, and was such a novelty that no one succeeded in curing it until a young physician arrived from the West Indies.

SMALLPOX.—In a treatise written by James Moore, member of the Royal College of Surgeons, published in London in 1815, and dedicated to Edward Jenner, Moore states that he learnt the following facts from the chronicles which have been preserved: The first settlement was made by Columbus upon the island Hispaniola or San Salvador, and he was actuated by humane motives, “but he was surrounded and succeeded when he died in 1506 by a low class of adventurers who were actuated by avarice and fanaticism.” It was computed that Hispaniola contained one million of inhabitants when the caravels of Columbus arrived, and Moore ascertained from the chronicles of this period that smallpox was introduced into the island in 1517. It of course spread rapidly, since no mode of prevention was known at this time except isolation, and the Indians had no apartments for quarantine purposes.

The bold endeavor of Cortez to conquer Mexico owed its success to the terror with which the natives were inspired by the introduction of smallpox into their country, rather than to anything accomplished by military art. Children without adequate domiciliary protection and parental care, attacked with smallpox usually die, and if a whole family be attacked, the condition of all is deplorable in the extreme.

In the history of *Ferdinand Cortez and the Conquest of Mexico*, it is stated that in 1518, when this navigator sailed from Cuba upon his expedition to Mexico, smallpox had not reached Cuba and that there was no person infected by this disease in his fleet. But Velasquez, the governor of Cuba, taking offence at the independent action of Cortez,

sent an armament with orders to seize and return him a prisoner. Before the armament sailed the smallpox reached Cuba, and although the Spaniards knew the nature of the disease, a negro having it was allowed to join the expedition. He landed, covered with pustules, among the Indians of Zempoalla, who were entirely ignorant of smallpox or of any method to mitigate its violence.

Dr. Moore says that the smallpox contracted from the negro spread through Mexico with such virulence that in a short time 3,500,000 natives were destroyed in this kingdom alone, and heaps of skeletons of those who perished of this malady were found years afterward in shaded localities where they had been left to die by their friends. It appears from a communication sent by an ecclesiastic connected with the national vaccine establishment, that the ravages by the smallpox in Central and South America were not transient, for in the new kingdom of Leon several warlike Indian tribes were nearly exterminated by this malady, and fifty years previously, heaps of bones, relics of this disease, were found in out-of-the-way places under tufted oaks; even now, according to this writer, so great is the dread of smallpox that if in certain of the tribes an Indian sees a companion stricken with this disease, he leaves him his horse and provisions, and flees to a great distance in the forest.

From the nature of smallpox we can readily understand how it rapidly extends over a wide area, even an entire continent, if not prevented by vaccination. But before the era of vaccination and of personal and domiciliary disinfection it must have been impossible to prevent the propagation of smallpox at any point where infected European navigators landed and came in contact with the natives.

That apostle of civil and religious tolerance, William Penn, a leader of the Society of Friends, or Quakers, sailed from England to the New World on September 1, 1682, with a crew of one hundred followers. When his vessel, the *Welcome*, reached its destination on the Delaware, two months afterward, it was a pest-house of smallpox, for one-third of those on board had died of this disease. The wide dissemination of smallpox through the temperate regions of North America must have resulted from the arrival of this vessel so strongly infected with the variolous virus.

It is well known that smallpox was early introduced into New England. That remarkable expounder of the Protestant faith and the ablest divine in New England, Cotton Mather, not only combated witchcraft with such vigor and determination that nineteen witches were executed, one of them, Giles Cory, by slow torture, but he also saw the necessity of stubborn resistance to smallpox, which destroyed and disfigured the early settlers of New England. Vaccination was unknown until 1775, when the protective power of the vaccine virus was discovered by the immortal Jenner. But inoculation by the smallpox virus was beginning

to be employed in the time of Mather, since it had been ascertained, though not believed by many of the laity and physicians, that inoculation with its own virus rendered smallpox milder. Mather strongly recommended inoculation at the peril of personal violence, so strong was the objection to it. The statement recently made that Mather, strongly opposed to the religious teachings of Penn, endeavored to intercept him in his voyage across the Atlantic and reduce him to a menial position in the West Indies, is probably a fabrication. But if not, and if he had succeeded in overhauling Penn's vessel, the *Welcome*, he no doubt would have wished himself back in Salem searching for witches, since it was much easier for him to subdue suspected witches than smallpox with which Penn's vessel was so completely infected. We can readily understand how smallpox introduced into the West Indies, Mexico, the Province of Pennsylvania, and into New England, in the absence of vaccination, rapidly spread over the Western hemisphere.

SCARLET FEVER.—Scarlet fever and measles, different as are their symptoms and anatomical characters, were considered forms of the same malady until the observations of Sydenham led to their differentiation about two centuries after the discovery of America. Inasmuch as they were not differentiated, the term measles, which was applied to an epidemic disease which appeared in the West Indies soon after their occupation by Europeans, may have been applied to measles or scarlet fever or sometimes to the one and sometimes to the other. But we infer from facts to be mentioned, that scarlet fever, insidious as it is and highly infectious, did not occur in the Western hemisphere until within the last two centuries. We will describe in our remarks on diphtheria the epidemic which, commencing in Kingston, about forty miles east of Boston, in 1735, gradually extended over New England, and reached New York City in two years. Monographs were written on this disease by Dr. Douglass, of Boston, and Dr. Bard, of New York. Dr. Bard says that Dr. Douglass described the same disease which he observed. We shall allude to this epidemic in describing the origin of diphtheria in this country. At present we desire only to say that Douglass states that patients exhibited a "flush in the face, and an erysipelas-like efflorescence on the neck, chest, and extremities. . . . "The flushing," he adds, "goes off gradually with a general itching, and in a day or two the cuticle skin scales or peels off, especially in the extremities." Is not this a clear description of scarlet fever? But some of those who have described this epidemic, as we shall see, say that one attack of the new malady does not preclude another, a noted characteristic of diphtheria and not of scarlet fever. It seems to me that this epidemic, which gradually spread westward over New England and Long Island, crossing the Hudson and extending to an unknown distance in the British possessions before it finally ceased, was in some places at least

a combination of scarlet fever and diphtheria such as frequently occurs at the present time.

With the exception of the brief allusions of Dr. Douglass to the widespread epidemic disease which exhibited the characteristics of scarlet fever occurring at the date mentioned, I have not been able to find any allusions to this exanthematic fever in the various writings which I have consulted prior to those published in the latter part of the eighteenth century.

Noah Webster, in his treatise on epidemics occurring in America tabulated those taking place since 1618. The first epidemic of scarlet fever which he recorded occurred in Philadelphia in 1774; subsequently it was frequent in America. Prof. Louis Thomas, of Leipzig, in his monograph on scarlet fever published in *Ziemssen's Encyclopædia* states that this disease spread from Europe over America. According to him it first appeared in Iceland in 1827. Twenty years later, he says, it extended over Greenland. Even if the statistics given are not exactly correct, we infer from the fact that scarlet fever was so seldom noticed by writers in America until within the last one hundred years, that its extension over the American continent did not occur for many years after the Kingston epidemic had either ceased or was rare.

MEASLES.—Most writers on the eruptive fevers agree that Rhazes, a Mahometan, belonging to the Arabic school of medicine, described measles in the tenth century. Sydenham in 1670, and Morton in 1674, gave such complete descriptions of measles and scarlet fever that they were henceforth regarded as distinct diseases, as we have stated above. In treating of scarlet fever we have stated that the late differentiation of this disease from measles renders it uncertain whether the eruptive malady which along with smallpox was so fatal to the Indians in the first decades following the discovery of America was measles or scarlet fever, but the following facts lead us to infer that it was the former.

Many people whose knowledge of measles has been obtained by observing cases treated under favorable circumstances can scarcely believe that epidemics of this disease are always very fatal among those who, like the American aborigines, are inadequately protected from cold and vicissitudes of weather, and whose surroundings are insanitary. Instances might be related showing the mortality of epidemic measles under such circumstances, as the epidemic among the Fiji Islanders, of which 40,000 died; the epidemic in the Faroe Islands, by which three-fourths of the inhabitants were attacked, with many deaths (Baumler); the epidemic among the Amazon Indians of Brazil, when half of the tribe perished; and the epidemic in the national army of Paraguay in the commencement of the war with Brazil, when one-fifth of the entire army perished.

~ In the late Civil War in the United States, according to the statistics

published in 1864, 38,000 cases of measles had occurred in the army with 14,000 (?) deaths. Moreover, as a reason for the belief that measles was introduced into America previously to scarlet fever is the fact that after its differentiation its epidemics were recorded by reliable writers many years before mention is made of scarlet fever. Thus Noah Webster had tabulated eleven epidemics of measles when he recorded the first epidemic of scarlet fever—that in Philadelphia in 1778.

DIPHTHERIA.—Those who have made a special study of diphtheria incline to the belief that its first occurrence in North America was in New England. It is stated that Samuel Danforth, of Roxbury, a graduate of Harvard, lost three of his children in 1659, within two weeks, from a disease which was designated “malady of bladders in the windpipe.” Again, John Josselyn made two voyages to New England in 1638 and 1663, and in his memoranda he states that the English in New England “are troubled with a disease in the mouth or throat, which hath proved mortal to some in a very short time. This disease is designated as quinsies and impostumations of the almonds with great distempers of colds.” Whether these early New Englanders had diphtheria or not I am unable to say, but nearly a century had elapsed from the time of Danforth and Josselyn when the much wider and more fatal epidemic, more clearly one of diphtheria, occurred. I have alluded to it in my remarks on scarlet fever, but the importance of the facts in regard to diphtheria requires that they be repeated in this connection.

On March 20, 1635, at Kingston, a town fifty miles eastward of Boston, the first case occurred of the disease, which was destined to overrun the British possessions in North America. The first forty attacked by it died; the first patient survived three days; the three next attacked lived four miles from the first patient. When the epidemic reached Boston, Dr. William Douglass made a full and accurate clinical examination of it, and wrote a monograph containing the result of his observations. Douglass, not knowing that Boston was soon to be the “Athens of America,” states in his exordium that in plantation life neither honor nor credit are to be acquired by writing. His sole object in publishing his monograph was to induce others to investigate the disease more fully. Death, he states, usually occurred from the fauces or neck, which was greatly swollen. J. Dickinson, A.M., of Cambridge, a clergyman, also published what he designated “Observations on that terrible disease vulgarly called ‘Throat Distemper.’” He writes: “Some expectorated incredible quantities of a tough whitish slough from their lungs. . . . I have seen several pieces of this crust several inches long, and near an inch broad, torn from the lungs by the vehemence of the cough.” Dickinson also remarks that one attack of the epidemic disease does not protect from a second. One patient had at intervals four distinct attacks, the last being fatal. The

fact of the recurrence of the throat affection is sufficient proof of its diphtheritic rather than scarlatinous nature, as is also the fact that the characteristic pellicular inflammation sometimes occurred upon abraded or wounded surfaces at a distance from the fauces, while the latter was but slightly or not at all affected. This widespread and gradually extending epidemic of diphtheria was the first occurring within historic times in North America and probably in the Western hemisphere.

The Honorable Cadwallader Colden, Esq., His Majesty's Lieutenant-Governor of the State of New York, wrote a letter to Dr. Fothergill in 1753, printed in the *London Medical Observations and Inquiries*, vol. i. He writes that this new throat disease extended gradually westward from Kingston, traversing New England, but it did not reach the Hudson River until two years had elapsed. Colden said that it remained for some time on the east side of the Hudson, but finally crossed to the west side, and he believed that it spread over all the British colonies in America. As might be expected, in due time it reached New York, and it was described by Dr. Samuel Bard in a paper published in 1771 and having the following title: "An Inquiry into the Nature, Cause, and Cure of the Angina Suffocativa, or Sore-throat Distemper." Bard wrote as follows: "Upon the whole, therefore, I am led to conclude that the disease called by the Italians morbus strangulatorius; the croup of Dr. Home; the sore-throat of Huxham and Fothergill; this disease, and that described by Dr. Douglass, of Boston, however they may differ in the symptoms of putrefescency and malignancy, do all bear an essential affinity and relationship to each other, and in fact arise from the same leaven." Dr. Jacob Ogden, of Jamaica, Long Island, described this widespread throat distemper as he observed it in the townships of Long Island. His last paper on this malady was published in 1774, thirty-nine years after the first case in Kingston, and just before the breaking out of the Revolutionary war. I am not aware that any outbreak of diphtheria occurred in this country during the eighteenth century, after the commencement of the war. The fact that families deserted their homes and fled to a distance for safety, especially from the cities along the Atlantic coast, may aid in explaining the cessation of this epidemic. After the disappearance of this widespread epidemic we hear little or nothing of the occurrence of diphtheria upon this continent until nearly a century had elapsed, except that cases of pseudo-membranous laryngitis, popularly designated membranous croup, occurred in many localities, but with little or no contagiousness. It may have been produced by the streptococcus, and have been a croup of the pseudo-diphtheritic nature.

True diphtheria prevailed in Europe in the first half of the present century, and received its name from Bretonneau in 1821. In the decade following 1850 it reappeared in a severe form in America, and conveyed by commerce and travel, it has extended over a large part of

the Western hemisphere, and has become established or endemic in its cities.

The facts related above show that while a higher mental attainment and the comforts and achievements of civilized life have resulted from the discovery of America by Columbus, the most fatal and infectious diseases of childhood have also been imported from the old to the new world. A recent French statistician says that the aggregate number of the French race is gradually diminishing, and largely from the effects of diphtheria.

It would be interesting were it possible to ascertain exactly what were the indigenous diseases of the children of American Indians. An interesting paper entitled "Diseases of the Indians West of the Mississippi" was published in the *N. Y. Med. and Phys. Journal*, 1822. The author writes as follows: "The diseases of the Indian children are few compared with those of civilized life. Irritations of the bowels sometimes occur, yet they are not at all frequent, and they have immediate means of relief in a prescription made from burnt mussel shells powdered and given in dittany tea. Diarrhœa and croup also occur, and those inhabiting marshy land, especially such as reside on the shores of rivers that are at times inundated, are somewhat subject to intermittent and remittent fevers in the autumnal and spring months." The writer adds that rheumatism and pulmonary consumption are common among the Indians west of the Mississippi, and that those who have been reduced by the enervating corruptions of the frontier settlers have of late been affected with typhus.

Again, in the report of the Indian establishment on an island in Lake Huron, in 1841-42, the following is the statement of the diseases prevailing: Toothache, rheumatism, neuralgia, ague, wounds of chest, and mild whooping-cough. It is seen that all of the fatal acute infectious diseases of American children of the present time which desolate innumerable homes, and check to a great extent the increase of population, have been imported from the Eastern hemisphere. The medicine man of the Indians was probably more successful in curing the Indian child by his incantations and few herbs, before the discovery of America, than is the educated European physician having a diploma from a renowned school, who is compelled to treat more fatal infectious diseases at the present time. Indeed, so far as we can perceive, if the Eastern and Western hemispheres had been created separately, revolving around each other like binary stars, the inhabitants of the Western world, though lacking the cultivation of the Eastern world, would have escaped the ravages of the most infectious and fatal of the maladies which affect the human race.

A CASE OF LEUKÆMIA, WITH RARE LYMPHOID GROWTHS OF ORBITS AND PAROTID GLANDS.

BY THOS. D. DUNN, M.D.,

PHYSICIAN TO THE CHESTER COUNTY HOSPITAL, WEST CHESTER, PA.

H. G., aged eight years, came under my observation in the spring of 1891, in consultation with Dr. Pyle, of Glen Mills, with a stubborn case of granular conjunctivitis. Although slightly anæmic at the time, he seemed to enjoy good health. There was no history of cancer, syphilis, or tuberculosis in either the father's or mother's family. He had a younger sister who made a complete recovery from a severe attack of scarlatinous nephritis a year before. The subject of this report had not been a robust child, but never had any serious illness. He was unusually intelligent and studious.

The lids improved under yellow oxide ointment and occasional applications of nitrate of silver solution.

For the anæmia tincture of the chloride of iron and cod-liver oil were prescribed. In autumn he returned to school and studied without discomfort. General condition good.

The patient was again brought to me December 15, 1891, for a slight swelling in the left parotid gland—about one inch in each diameter. This swelling was quite hard, with well-defined outline, and immovable. It impressed me as a growth of unusual position and character. It was not tender, but was slightly adherent to the skin, which was not discolored except by enlarged subcutaneous veins.

The parents noticed the swelling three weeks previous to my examination, but attributed it to cold contracted at school, where he sat by a broken pane of glass—his left side being exposed. The cervical lymphatic glands were not enlarged. Skin and mucous membranes pallid. He was ordered a highly nutritious diet, the syrup of iodide of iron internally, and locally tincture of iodine to the enlarged gland.

Dr. Pyle was again called to the case January 23, 1892, and found slight increase in the parotid swelling, and an appreciable enlargement of the cervical lymphatic glands of left side. During this period the anæmia and loss of flesh steadily progressed in spite of the most carefully regulated diet. Dr. Pyle directed as much easily assimilated nourishment as possible, and the continued use of tincture of chloride of iron, Fowler's solution, bichloride of mercury, and, at times, quinine and cod-liver oil. Soon the axillary and inguinal lymphatic glands began to enlarge. About the middle of March a hardness began to develop over the eyes, with slight thickening in both temporal regions. The pulse was weak, and ranged from 96 to 116. Temperature was never below 99°, or above 101° during February and March. He kept about the house, and was frequently on the piazza for play. The anæmia and emaciation steadily progressed.

April 5. The patient contracted a heavy cold, causing a temperature of 103°, and severe sore-throat. I was called in consultation April 12th, and found an ashy gray membrane over both tonsils, extending to uvula and soft palate; submaxillary lymphatic glands enlarged and

tender; temperature 102° ; pulse 130; swallowing difficult and painful; marked emaciation; lips, tongue, and nails blue and very anæmic; occipital, inguinal, axillary, and cervical lymphatic glands moder-

FIG. 1.



FIG. 2.



ately enlarged, but not tender; spleen and liver slightly enlarged, but no tenderness over them. The patient had suffered from attacks of pain in splenic region for some time. The left parotid gland

was greatly enlarged, of stony hardness, outline well defined. There were also crescentic bodies over either eye, not firmly connected with lids. These swellings began at nasal end of orbit, and extended outward beyond external canthus, the larger end toward the nasal angle. These were also of marked hardness, but somewhat elastic, free from tenderness, slightly attached to lids, but firmly attached to orbital arches. They caused considerable exophthalmus, but only partially interfered with motion of lids. No conjunctivitis; corneæ healthy; vision normal.

Similar, but flat, hyperplasias were found in each temporal region; the outline of these was not so well defined. A careful search revealed no other such growths. Marked deafness was attributed to the closure of external auditory canals by the parotid and temporal hypertrophies. Treatment was directed to the recent diphtheritic complication.

14th. The condition of throat was improved; temperature 101° ; pulse rapid, feeble, compressible; submaxillary lymphatics decreased and less tender to touch. Nourishment and stimulants were given freely and well retained. A drop of blood under the microscope showed a decided increase in white corpuscles. The blood was of a very pale color, resembling sero-pus mixed with blood. This examination confirmed the diagnosis of leukæmia, which had been suspected at previous visits by both Dr. Pyle and myself.

17th. Slight improvement in the general condition, owing to the subsidence of the acute diphtheritic attack. Temperature 100° ; pulse 124.

At this visit a careful blood-count was made. The result showed one colorless corpuscle to fifteen red; 1,830,000 corpuscles (of which 122,000 were white) to a cubic millimetre, and about 30 per cent. of hæmoglobin. Both hæmoglobin and number of corpuscles were less than one-third the normal amount.

May 7. I saw him for the last time. The anæmia and emaciation had increased; temperature $100\frac{2}{3}^{\circ}$; pulse 124, and very feeble. The deafness had also increased, but vision was still good. Unfortunately no ophthalmoscopic examination was made. The leukæmic growths had all increased, and a small growth about one-half inch in diameter had developed in the right parotid gland, directly in front of the ear.

The little sufferer had had several attacks of epistaxis, and on May 5th had two hemorrhages of bowels. He steadily grew weaker, and died of exhaustion May 18th. Unfortunately, we were unable to secure an autopsy, or even to obtain a portion of the described growths for microscopic examination. There can be no doubt, however, as to the diagnosis of leukæmia.

After a careful search I have been able to find the record of but few cases of similar leukæmic growths; doubtless there are others, but the scanty literature of the subject is indicated by the absence of any reference to this condition by modern writers in our leading medical works.

Dr. Henry D. Noyes (*Diseases of the Eye*, p. 666), however, cites a case of lymphoid growths of both orbits in Hodgkin's disease. This case was reported in full in *The Medical News*, 1882, vol. ii. p. 681, by Dr. Richard H. Derby.

Cases have been carefully reported by Chauvel, Leber, Osterwald,

and Fröhlich. The fact that I have been unable to find any reference to these in English, together with their very striking similarity to the clinical picture herein presented, justifies a somewhat full abstract of them.

FIG. 3.



Dr. Richard H. Derby's case of Hodgkin's disease.

Chauvel's case, reported in *Gazette hebdomadaire*, 1877, No. 23. Patient, aged forty-one years, custom-house officer, was admitted to the military hospital, Val-de-Grâce, October, 1876, for a tumor of left side of face. Previous to this his health had been good; no history of syphilis. In July, 1876, a small swelling appeared in left upper eyelid. It developed rapidly, and was free from tenderness and pain. By September it became painful. On admission to Val-de-Grâce the swelling had extended to the cervical lymphatic glands of both sides, which formed a chain the length of the sterno-cleido-mastoid. There were tenderness and redness at the most prominent point above left eye. Ulcers were found on left buccal surfaces. Neuralgic pains of left side of face and head existed, with profound cachexia. Tonic treatment and sedative applications were resorted to without benefit. Diagnosis by Prof. Perrin: sarcoma of face with symptomatic adenitis. November 12th he came under the care of Chauvel. The tumor occupied the left supra-orbital region, left upper eyelid, extending from slightly above eyebrow to root of nose. Left jaw also swollen. Left eye completely closed.

The tumor was elastic and hard, and seemed firmly attached to subjacent parts. There was slight deafness. Patient saw black spots before right eye. Ophthalmoscopic examination revealed normal media. Papilla also normal, but outside of disk were several hemorrhagic spots, one large one above and one below. Prof. Perrin states that the appearance of the retina was that of hemorrhagic retinitis, the result of his general state, and possibly leukæmia.

November 19th, had slight hemorrhage of bowels.

Died November 21st, from exhaustion.

The tumor of upper eyelid was composed of cellular elements analogous to those of lymphatic glands; these were united without apparent stroma. The growth extended to all parts of the eyelid, and was not encysted. Teas-

ing the tissue disengaged reticulum similar to that of lymphatics. Unfortunately the medulla of the bones was not examined. The only lymphatic glands involved were those of the cervical region. The spleen was somewhat enlarged. Liver greatly enlarged; cells not diseased; interlobular capillaries were dilated and filled with leucocytes; masses of leucocytes were also found in interlobular spaces—changes which characterize the leukæmic liver. The right side of the heart was filled with chicken-fat clot. Large quantities of leucocytes were found in the vessels of the heart, but the organ was free from disease.

Unfortunately, no microscopical examination of blood was made, but the marked anæmia, enlargement of the lymphatic glands of the neck, and the accumulations in the vessels of the heart and the hepatic glands make the diagnosis of leukæmia indisputable.

Leber's case, reported in *Archives of Ophth.*, 1877, No. 24, p. 295. C. F., aged forty-eight years, with the exception of an attack of rheumatism had enjoyed good health prior to August, 1876. No history or evidence of syphilis or malaria. At that time he noticed a swelling of under lids and later of upper lids of both eyes, and suffered from languor and weakness. In September was treated by a foreign oculist with iodine internally and locally, without benefit. Had an abnormal prominence of eyeballs. On account of eye trouble appeared before Göttingen eye clinic, April, 1877. His condition was striking and unusual. Lids of both eyes enormously enlarged in all diameters on account of elastic growths which were not adherent to edge of orbits. Skin of a brownish color, with enlarged subcutaneous veins. Marked exophthalmus, the result of the outward pressure of tumors, which extended to subconjunctival connective tissue; also smooth distended swelling in region of temporal muscle, which extended toward forehead, larger on right side. Nasal cavities and mouth normal. Ophthalmoscopic examination revealed an extensive hemorrhagic retinitis of both eyes; papillæ red but not swollen. Condition similar in each eye. Vision: O. D., 20/xx; O. S., 20/xxx. Heart normal. Urine: specific gravity 1010; reaction acid; considerable albumin; granular casts and fatty epithelium.

Liver and spleen decidedly enlarged. Blood examination showed a large increase of white blood-corpuscles.

A small piece of growth removed from conjunctival surface was examined. It was soft, somewhat jelly-like, slightly transparent. Microscopical examination showed lymphoid cells crowded into connective-tissue meshes. This growth was, doubtless, analogous to leukæmic growths in other organs. Lymphatic glands of both sides of neck enlarged, and large, painful, thickened tumefaction over sternum. Marked lassitude and debility. Temporary improvement derived from general sweats and acetate of potassium. In May the patient's general condition was much worse; temporal and orbital tumors increased; liver and spleen greatly enlarged.

His condition steadily grew worse, and he died at the end of October, delirium having existed for eight days.

Leber believed this interesting condition to be the result of leukæmia. He, however, admits the possibility of the retinitis being due to the nephritis, but remarks that the extravasations extending to the periphery of the eyeground are unusual in the latter disease. Unfortunately, an autopsy was refused.

Osterwald's case, reported in *Archives of Ophth.*, 1881, No. 27, p. 203. Patient, a boy, aged four years, appeared at Göttingen eye clinic May 25, 1881. Parents had always been healthy; both syphilis and hereditary disease denied. The boy had measles at the age of two years, was pale and weak afterward, otherwise had been healthy.

Soon after Easter parents noticed a swelling in right upper eyelid, and later a similar swelling in left, the eyeballs protruding. When he appeared at the clinic the following symptoms were observed: Marked double exophthalmus. Both upper lids enlarged in all diameters, and under skin of left a network of bluish veins visible which extended to forehead and right temporal region. Right upper lid strongly pressed out by a hard, elastic tumor. This tumor

began at orbital arch, to which it seemed attached, and extended from root of nose to outer angle of eye. In left upper lid was a similar growth, though not so large. In temporal region of either side was a smooth, round, subcutaneous swelling of doughy consistency.

Left conjunctiva and cornea normal; right conjunctiva injected and cornea ulcerated. Ophthalmoscopic examination showed left papilla cloudy, veins disturbed and tortuous; cornea interfered with examination of right retina.

The presence of hemorrhage could not be determined on account of restlessness of patient. Vision not accurately ascertained, but the face of a watch could be seen. Small hardened lymphatic glands on both sides of the neck. Complexion extremely pale and cachectic. Liver and spleen somewhat enlarged. Blood-count showed one white corpuscle to three or four red.

May 27. Prof. Ebstein was called to the case, and he mentions, in addition to the above, enlargement of inguinal lymphatic glands, and nodules along the costo-cartilaginous articulations of the ribs. Blood, fluid and watery, but not wanting in fibrin.

30th. Pulse rapid and feeble; some fever.

June 1. Slight fever.

2d. Temperature, 38.3° C. Epistaxis. Evening temperature, 38.8°.

3d. Evening temperature, 39.5°. Bleeding from nose and mouth. Died at midnight.

Autopsy by Prof. Orth. A number of small tumors, firm and of yellowish color, were found in both pia and dura mater, which were distinctly of adenoid character. Heart contained large, yellow, firm coagula. Strong tendency to ecchymosis over surface of heart, pleuræ and the entire alimentary tract. Bronchial lymphatic glands normal, but cervical, axillary, inguinal, and mesenteric glands enlarged, as were liver and spleen. Retinæ contained numerous small hemorrhages. Papillæ swollen and pale.

The orbital tumors on section showed meshes of reticular tissue infiltrated by leucocytes; the meningeal nodules showed the same structure. Orth regarded these leukæmic neoplasms as being of the lymphadenoid variety and a secondary result of the disease. The marrow of the ribs and right femur was soft and tender, and of the brownish-yellow color of leukæmic marrow.

Fröhlich's case, reported in *Wiener med. Wochenschr.*, 1893, Nos. 7, 8, 9, 10. A man aged twenty-five years, a painter, was first seen July 27, 1892. His mother had had frequent attacks of pulmonary hemorrhage; father and several sisters healthy. In youth the patient suffered from rhachitis, of which there are still marks on thorax. No history of syphilis.

May 1. Glands of axilla enlarged, associated with cough, expectoration, and dyspnoea; soon afterward other glands were involved and upper lids of both eyes began to swell.

July 27. Tumors in lids, size of walnuts; fundus of left eye normal; right could not be examined on account of growth. Tonsils and pharynx normal; vocal cords pale and movable, with two dark-red subcordal tumors. Cervical and axillary lymphatic glands enlarged, also small swelling in middle of forehead, right humerus, and right tibia. Examination of blood showed: red corpuscles, 3,570,000; white, 137,000—1 white to 26 red; hæmoglobin 70 per cent.

30th. Tracheotomy performed for the alarming dyspnoea, with complete relief. A sharp attack of pleuro-pneumonia terminated fatally November 24, 1892. Blood-count during the attack showed 2,882,353 red corpuscles, 8823 white—1 white to 326 red. The writer attributes this apparent improvement in the condition of blood to the pleuro-pneumonia causing the destruction of lymphatic elements. The swelling in orbits and lymphatic glands and the subcordal tumors were greatly reduced, the latter so much that the voice before death was restored. Careful examination showed the tumors to be lymphomatous, and the reporter considered the disease pseudo-leukæmia.

Biesiadecki (*Jahrb. d. Ges. d. Aerzte*, 1876) describes a case of leukæmia with tumors of skin and enlargement of parotid glands. He also

cites cases related by Haltenhoff, Mikulicz, and Gordon Norris, in which were similar growths of upper lids, parotid, and other salivary glands.

At the last Dermatological Congress, Peltauf and Riehl discussed the question of leukæmic skin tumors from a pathologico-anatomical standpoint.

Fuchs (quoted by Fröhlich) mentions the case of a man, aged sixty-one, who had for two years large lymphoid growths of upper lids, and Kaposi (*Jahrb. d. Ges. d. Aerzte*, 1885), one of lymphoderma perniciosa in connection with leukæmia.

Birk (quoted by Fröhlich) has called attention to a double exophthalmus dependent upon lymphomatous new growths of the back part of the orbit, but it is not stated whether leukæmia was present.

Hochsinger and Schiff (*Vierteljahrsschr. f. Dermat. u. Syph.*, 1887) mentions a case of leukæmia in an eight-months-old child, in which were lymphomatous growths involving head and skin.

Ziem (quoted by Fröhlich) cites a case of symmetrical swelling of both upper lids causing ptosis, in a man aged thirty, associated with enlargement of parotid glands, lymphatics of neck, of axilla, and orbital gland. Spleen not enlarged. Examination of blood showed nothing abnormal. A microscopical examination of a piece of the tumor showed quantities of granulative tissue. In the centre of the tumor was a tendency to cheesy formation, without the presence of tubercle bacilli. An intercurrent attack of erysipelas caused the tumors almost to disappear, but they returned after the attack subsided.

NEURALGIA OF THE RIGHT CRANIAL NERVE OF SIXTEEN YEARS' DURATION; EXCISION OF THE THREE DIVISIONS AT THE GASSERIAN GANGLION; DEATH.

By J. T. ESKRIDGE, M.D.,

PROFESSOR OF NERVOUS AND MENTAL DISEASES IN THE MEDICAL DEPARTMENT OF THE
UNIVERSITY OF COLORADO; NEUROLOGIST TO THE ARAPAHOE COUNTY, THE
ST. LUKE'S, AND THE DEACONESS'S HOME HOSPITALS;

AND

E. J. BAKER, M.D.

HISTORY AND EXAMINATION BY DR. ESKRIDGE.

ERNEST G. G., aged fifty-two years, farmer, was brought to my clinic at the Medical Department of the University of Colorado, early in July, 1892. The family history shows freedom from insanity, epilepsy, neuralgia, and consumption. The father and mother lived to advanced age; the cause of their death is unknown.

The patient was always well and strong until 1876, when he cut his left wrist with a piece of pottery. A violent cellulitis involving the entire forearm resulted, numerous abscesses of the arm developed; he was

considerably reduced in strength, and confined to his bed for a period of six weeks. He stated that he apparently completely recovered from the results of the wound, but that a few months later, his body, while overheated, was rapidly cooled by a draught of air. The next day after the exposure he suffered from severe neuralgic pain in the right side of the face. The pain was paroxysmal, and most intense in the teeth and the right eye, although the entire right side of the face was involved to a slight extent. No pain was experienced in the distribution of the fifth cranial nerve over the scalp. The attack lasted six weeks. He was free from pain for a year, when he had a second seizure, lasting only a few days, in which pain was limited to the right side of the face. For several years he suffered from one or two seizures of neuralgic pain each year, but the attacks returned more frequently, became longer in duration, and the pain was more severe as time wore on, until six or seven years ago, when he was suffering about half the time. During the last three years the pain in the face has been constant. One year ago he began to suffer from severe pain in the large joints, and these have swelled considerably.

Status præsens: He has a large frame, but is thin, and presents evidences of intense suffering. He says he is one hundred pounds lighter than he was fifteen years ago. He suffers from severe and constant pain in the right side of the face, and his misery is still further increased by frequent paroxysms of pain, which causes the muscles of the right side of the face to contract convulsively. The pain has never extended above the supra orbital ridge, but it extends backward from the exit of the supra-orbital nerve to a point above the right ear. The pain has never involved the nerve in its distribution to the hairy scalp. The second division of the right trigeminal nerve is the seat of constant pain; the first, in a portion of its distribution, is frequently painful, and the third division is occasionally so. On carefully testing for the various forms of sensation no changes from normal were found except in the right side of the face, where, especially in the region of distribution of the first and second divisions of the great sensory nerve, there seemed to be a condition of hyperalgesia. The contact of my finger, the æsthesiometer, and sometimes even of a feather, would cause him the most violent paroxysms of suffering. It was impossible, on account of his sufferings, to test tactile and temperature senses on the right side of the face.

Taste, right, imperfect; left, normal; smell was very much more pronounced on the left than on the right side. Hearing for watch was poor on both sides, but the tuning-fork was better heard with left ear. Eyes presented no marked changes further than slight paleness of the nerves, which was more marked in right eye. He said that vision had lessened considerably during the last two or three years. In the right eye it was 20/XL; left, 20/XXX. The fields were normal.

On examining the motor system, nothing was found which could not be accounted for by the swollen and painful joints. The left shoulder, both knees, both ankles, and several toe joints were the seat of pain, and were swollen and limited in motion.

He was, at my request, admitted into the Arapahoe County Hospital. He was kept in bed, and given large doses of sodium salicylate. This soon relieved his joint pain, but it had no appreciable effect on his trigeminal nerve pain. Large doses of quinine were tried, but this seemed to give no relief. No agent employed appeared to have the slightest permanent effect in lessening his suffering.

After a careful study of his case, notwithstanding his reduced state of health, I not only advised but urged him to submit to the necessary operation for the removal of the Gasserian ganglion, or the excision of the three divisions of the nerve at this ganglion, as the case might be. He replied that he had placed himself in my care, and would gladly do anything that promised him entire relief from his intolerable suffering. The attending surgeon was notified, and set the day for the operation. After the man was anæsthetized the surgeons decided to first try the superficial operation, and then, if no relief was obtained, to excise the Gasserian ganglion. I did my utmost to dissuade them from this procedure, urging that the man had submitted to the operation with the expectation that only one operation would be necessary, that there was no good reason to expect the slightest relief from excision of the peripheral ends of the three grand divisions of the fifth cranial nerve, and that when he should find no relief from the minor operation, he would become discouraged, and refuse to submit to the major. I was especially anxious that the radical operation should be performed, because the man had come to Denver from a neighboring State, and desired me to decide the degree of the operation necessary for his relief. The surgeons did not seem to be willing to undertake so great an operation at that time, and I submitted, hoping, without much reason for hope, that some good would be accomplished by the superficial operation.

The operation consisted in dividing the distal ends of the three divisions of the trigeminal nerve at the mental, supra-, and infra-orbital foramina. Before the patient regained complete consciousness from the anæsthetic he began to groan with pain, and after the influence of the anæsthetic had worn off he said the pain was greater than it was before operation. He remained in the hospital just long enough for the wounds to heal. He suffered constantly, and was disgusted with our failure to relieve him, and left, refusing to submit to another operation.

I never saw the patient after he left the hospital. Dr. A. J. Baker, who performed the major operation on him, about one year after he had submitted to the minor, will give an account of his condition at the time of the second operation.

OPERATION AND REMARKS BY DR. BAKER.

Mr. G., reported to me for treatment in July, 1892, when I turned him over to Dr. Eskridge, who gives the above report.

He also reported to me immediately after leaving the hospital, and was soon compelled to return to his home, as his stay in the hospital had practically spent all the money he could raise. He moved to Denver in May of the present year, where I found him on my return to the city, about the middle of June.

His condition was very much worse than when I last saw him, nearly a year before. He was so nervous that he would break down and cry

over the most trivial affairs. His assimilation was very poor, and gradually growing worse. He had not been free from his neuralgia at any time during the last year, which had greatly increased in severity. This pain came on every few minutes, night and day, and was almost as severe as the severest pain of labor, convulsing, apparently, every muscle in the body. He was using much larger doses of morphine, and also drinking nearly half a pint of whiskey daily. His family had taken a loaded revolver from him three different times during the last year while he was suffering from these pains, when he was trying to discharge the contents of the revolver into his brain. I appointed June 26th for the operation, and desired very much to postpone it on account of a lack of time, when I learned that he had decided to cut his throat that night if I did not operate.

As circumstances compelled me to operate, if at all, in his house, I ordered all of the woodwork scrubbed and the whole house thoroughly disinfected. I endeavored to make everything as perfectly aseptic as possible, and feel that this part of my work was quite successful.

I operated in the afternoon of June 26th. I followed Rose's plan quite closely, making one circular incision through the skin from above the right zygomatic arch, near the eye, back near the ear, downward in front of the ear, and then followed the posterior edge of lower maxilla to near where the facial artery crosses it. This flap was dissected forward and stitched to skin near the mouth. The zygoma was then exposed and drilled, two holes being near the front and two near the back part of the arch. I then sawed the arch between each of these pairs of holes, and turned the arch with the masseter muscle downward. I then removed some adipose tissue, which exposed the coronoid process of the lower maxilla, which was divided with bone-forceps, and the temporal muscle turned upward. I then made a diligent search for the internal maxillary artery, but did not find it. So I proceeded to remove the external pterygoid muscle from the great wing of the sphenoid bone to search for the foramen ovale. I secured the inferior dental and gustatory nerves near the lower border of the external pterygoid muscle and internal to ramus of the jaw, and followed them up to the foramen ovale.

The muscle being removed from the wing of the sphenoid back to the foramen ovale, I placed the trephine anterior and external to the foramen, as indicated by Drs. Andrews and Rose, and took out a half-inch button. I was able to depress the trephine by means of an extension I will describe later, so that the plate was cut through almost simultaneously. I then cut away the plate back to the foramen ovale with a pair of rongeur forceps.

There was no pulsation of the brain discernible, nor the slightest protrusion through the opening just made. The dura was very hard, giving almost the impression of bone—certainly an inflammatory thickening. The conditions there made it impossible to reach the ganglion behind, as recommended by Rose, so I was compelled to work in front. I secured the second branch of the fifth nerve, clipped it off with a pair of curved scissors, and entered the capsule of the Gasserian ganglion between the first and second branches. I then scooped out the contents of the capsule, and clipped off its lower part, leaving its upper part intact.

I then removed the coronoid process from the temporal muscle previously severed, checked the hemorrhage as well as I could, and thoroughly cleansed and closed the wound. I took the time to wire the zygoma in

place, the drilling and wiring taking less than five minutes. I thought this time not wasted, as necrosis has often followed operations where the zygoma has not been wired in place.

The oozing was very excessive, hindering us greatly in the operation; yet we had no trouble from arterial hemorrhage. I closed the fascia over the zygoma with catgut, and then closed the flap of skin with a continuous catgut suture, the wound coapting exactly. With the exception of the great difficulty of anæsthetizing the patient, and inability to keep him perfectly under its influence, which hindered us considerably, we met no greater difficulties than we anticipated.

The patient slept nicely all night, and was perfectly relieved of his neuralgia. He had only about a degree of temperature elevation the next morning, but he had not taken much nourishment. I ordered milk given him every three hours during the day. On my return in the evening I found that he had only taken about a glass of milk, and was very restless. His temperature then was about 101° . As I learned that no arrangements had been made for a competent nurse that night, I decided to stay with him myself. I was only able to control the restlessness for a brief period at a time. His pulse gradually weakened, and he died of shock thirty-eight hours after the operation.

I could not secure a post-mortem, which was certainly very desirable. I opened the wound, however, sufficiently to find that there was not a particle of pus present, and that everything about the wound seemed to be in perfect condition. The wound was perfectly united all around, and there is no doubt, had the patient survived the shock, that we would have had a perfect result.

It was probably a mistake to attempt such an operation at his own house, even under the circumstances; partly because it was not possible to make his house as perfectly aseptic as a hospital, but principally because he could not be properly controlled at home.

To my knowledge, this operation has only been performed twelve times. All cases were perfectly relieved of their neuralgia, and only two cases proved fatal. Dr. Rose, of England, has performed the operation six times, his last case proving fatal. The same number of operations have been performed in America; twice in Chicago, once in Kansas City, and three times in Denver, my case only proving fatal.

THE COMPARATIVE VITALITY OF MEN AND WOMEN.

By BRANDRETH SYMONDS, A.M., M.D.,

SENIOR MEDICAL EXAMINER FOR THE MUTUAL LIFE INSURANCE CO., OF NEW YORK.

WE cannot always agree with Sidney Smith's dictum, "There is nothing so unreliable as figures, unless it is facts." Much less substantial oftentimes are the impressions which are held by the laity, and occasionally even by the profession. The writer had some nebulous ideas dispelled recently by an investigation of the mortality of men and women. He submits herewith the conclusions.

It is well recognized that women, although more delicate than men in most respects, have a greater average longevity. And this is true in spite of childbearing. All life-tables founded on a general population show this. Among the best of these tables is that constructed by Dr. Farr on the facts furnished by the English census of 1841 and 1851, and the mortality reports. It is known as the English Life-table No. 3. In this table it was noticed that woman enjoys a greater expectation of life at every age, without exception, than man. This is commonly supposed to be due largely to her more sheltered position, which is chiefly obtained at man's expense. His dissipations also are supposed to account somewhat for his inferior longevity. It is doubtful, however, if either of these factors is of much importance. The table of life-expectations tells only half a truth. A greater tenacity of life in the later years may more than counterbalance a higher mortality in the earlier years.

To get at the whole truth we must examine a table which shows the mortality per mille for each age of each sex. In this way each year stands by itself, and is not affected by antecedent or subsequent years. The writer constructed a table for this purpose. The male mortality was taken from an article by D. I. McG. McKenzie in the *Journal of the Actuarial Society of America*. The female mortality was computed by the writer. The life-table from which the figures were obtained is that known as Dr. Farr's English Life-table of Healthy Districts. This is based on the mortality records and census reports of those selected districts in England in which the annual mortality per mille was seventeen or less. Although it necessitated more labor, this table was used because it is nearer the normal. All the facts shown by it are substantiated with no material difference by Farr's English Life-table No. 3. From this mortality table the following conclusions were drawn:

1. During the years 0 and 1 the female mortality is much less than the male, being 92.64 and 31.88 per mille against 112.80 and 35.08. For the next three years it remains still a little less. During this period the distinctions between the two sexes in hygienic matters are practically *nil*. Both are dressed alike and fed alike. But in spite of this the female mortality is less.

2. About the age of five, or a little earlier, some difference in dress, exercise, and exposure is manifested. The girl stays in the house and plays with her dolls, while the boy is outside making mud-pies or throwing snowballs. The influence of these changed conditions is promptly shown in the female mortality. It now passes that of males. After this it steadily falls in both sexes to the year twelve, when it attains its lowest point. It is then 3.56 per mille for males and 4.28 for females. From that point it constantly rises for both sexes, being always larger each year than the preceding one.

3. It is commonly supposed that the establishment of the sexual function is attended with graver consequences in the female than the male. An inspection of the table threw some doubts on this. It is true that from twelve to sixteen the female mortality increases more rapidly than the male, the gain being respectively 1.68 per mille and 1.18. But from sixteen to twenty the increase is much more rapid on the male side, being 2.21, while the female is only 1.70. In England the age of puberty is not much earlier than fourteen or fifteen. Furthermore, those diseases which can be ascribed to the development of this function are usually chronic. However, another factor enters which doubtless has some influence. Most men have to begin at this age the struggle for existence, with its attendant hardships and vices. Of course, in this contest the weaklings would be thinned out early. It is impossible to decide which of these factors is the more important in increasing the male mortality at this period.

4. From this point the male mortality slowly gains on the female until the year forty-six, when it just equals it, both being then 11.11 per mille. This year represents the practical end of childbearing. To the influence of parturition we can probably ascribe the greater female mortality during the preceding years. The difference, however, is never great. It is most marked at the year thirty-four, when it amounts to 0.81 per mille. The male mortality is then 8.52 and the female 9.33.

5. The next ten years, from forty-six to fifty-six, represents the period of the menopause in women, a great climacteric. It is "the critical period for women" in the minds of the laity and most of the profession. But a careful examination of the table showed the contrary. The rise in female mortality during this period is just as gradual as it was before. Much more startling was the appearance of the male mortality. Certainly this is *man's* critical period. The old doctrine that he too had a great climacteric is most strikingly shown. In the ten years from forty-six to fifty-six the gain in mortality per mille per annum for males is 6.32, while for females it is only 3.47. We can only guess at the causes of this greatly increased mortality among men. Perhaps his dissipations just now make themselves felt; perhaps the syphilis of his youth is just drawing its last check; perhaps the hardships of his occupation have just now bankrupted him. But why should these manifest themselves at a period which is popularly fraught with so much peril only to women?

6. From this point the mortality of women gains so rapidly on that of men that the period of fifty-six to sixty might be called a "critical period" for them. After this the two run on to the end of the chapter in nearly parallel lines, the female being always less than the male. The difference between the two ranges from 1.4 at the age of sixty, to 8.7 at the age of eighty. After this it fluctuates considerably.

7. It is often said that although woman's average longevity is greater than man's, yet great age is attained only by man. Biblical references on this point are not of much value, for in the days of the patriarchs few women received historical consideration. In a list¹ of about 300 persons who had attained the age of 120 years, or greater, the writer counted the names of over sixty women. This is 20 per cent., and a fair proportion when one considers how little historical importance was attached to women a century or two ago.

8. Some of the inequalities in the mortality of men and women have been explained in the previous sections. But one great fact remains inexplicable, and that is woman's greater tenacity of life. It cannot be due to her sheltered position and comparative freedom from vice, dissipation, worry, and toil, for it is manifested in the cradle as well as in old age. It is strikingly shown in the years of infancy; then the interregnum of bad management in childhood, and later of childbearing, affect it adversely. But after these it again asserts itself.

Perhaps this superior vitality is a relic of the time when our ancestors swung from tree to tree by the aid of their tails. They were undoubtedly polygamous. At least Darwin says that the highest apes now extant are polygamous.² If they were polygamous, there must have been an excess of females. This excess could have been maintained in only two ways, either by a plurality of female births or a greater tenacity of life in those females which were born. But we know that at present there is a plurality of male births everywhere, although the popular impression is to the contrary. An inspection of the birth reports of the following countries and States for the years mentioned proved this conclusively: Russia, 1858; Austria, 1857; France, 1860; England and Wales, 1860; Prussia, 1861; Spain, 1861; Belgium, 1860; Bavaria, 1860; Norway, 1860; Greece, 1861; Indiana, 1886; Michigan, 1872; New Hampshire, 1885. In every case there was a plurality of male births. The average of the whole showed thirty-nine males to thirty-seven females.

This fact disproves the existence of a female plurality at birth, and it seems fair to assume that such was the case likewise in those primitive times. If so, the hypothesis of a greater tenacity of life among the primeval ape-women must be accepted. Perhaps from these Eves it has descended to their present successors.

¹ Insurance Guide and Handbook, by C. Walford, London, 1867. The value of the evidence in most of these cases of extreme longevity is very dubious, but that applies equally to both sexes.

² Descent of Man, page 217. He mentions the gorilla, some baboons, mycetes caraya, and cebus capuchinus, as being all polygamous.

REVIEWS.

A TEXT-BOOK OF OPHTHALMOLOGY. By WILLIAM F. NORRIS, M.D., Professor of Ophthalmology in the University of Pennsylvania, and CHARLES A. OLIVER, M.D., Surgeon to Wills Eye Hospital, Philadelphia. In one octavo volume of 641 pages, with 357 engravings and 5 colored plates. Philadelphia: Lea Brothers & Co., 1893.

FOR some time we have looked for this work, as it was known that the authors had for several years had it in preparation, and their high standing in the profession had warranted the hope that the ideal textbook at last had come. We are sorry that our hope was unfounded, for we confess to deep disappointment, in that nothing new or in the way of progress is to be noted; especially are we at loss to know why reproductions of old prints are constantly used in new books when photographs of actual cases, to be had at every clinic, can be so easily used, and when properly tinted in natural colors make an object-lesson not easily forgotten, beside making the volume containing them of marked value. The volume is divided into two parts, the first part by Charles A. Oliver, M.D., and the second part by the senior editor, William F. Norris, M.D.

Part I. contains two hundred and eighty pages, divided into ten chapters; these embrace the anatomy, physiology, and embryology of the eye, together with optics and the errors of refraction. Part II. is divided into nineteen chapters and treats of the diseases of the eyes, embraced in three hundred and forty-one pages.

The chapters on Embryology, Anatomy, and Physiology are good and well illustrated; we note, however, that the inter-retinal fibres of the optic chiasm are spoken of, when we were under the impression that this old idea had been abandoned.

Chapter IV., "Optics, Catoptrics, and Dioptrics," is exceedingly full, clear, and concise, and will be fully understood by all readers. Chapter VIII. is devoted to an exposition of the "shadow test," "retinoscopy," etc., the author preferring to use the term *fundus reflex test*, "as it distinctly shows that the results are dependent upon the play of light and shadow, through media of different powers, strengths, and curvatures, on the pigment coat of the retina." He says: "It should never be used for the prescribing of correcting lenses, except where it is impossible otherwise to obtain proper subjective results." Chapter IX. "Methods of Determination of Errors of Refraction and Accommodation." We regret very much that in this chapter we find much to criticise adversely as to methods employed, and shall be obliged to call attention to several gross errors of statement. After speaking of Placido's disk as a means of determining astigmatism, Dr. Oliver says: "If more accurate objective study as to the angle and the degree of corneal astigmatism be

desired . . . the so-called *ophthalmometer*—more correctly *keratometer*—should be brought into use. Unfortunately, however, its great cost, the difficulty of accurate adjustment to most students, and the discrepancy in its answers when incorrectly used seem to hinder it in some degree, in its present form, from being more generally employed in ordinary clinical work."

Then follows a half-page illustration of the Javal and Schiötz ophthalmometer of 1889 in a first edition text-book published in the middle of 1893. Why not figure the more recent instrument with the more complete illuminating electric-light attachments? After describing the ophthalmometer and the plan of its operation, the author concludes the paragraph as follows: "If the aerial images in the tube separate in the vertical meridian, this meridian has the shorter radius, whilst if they overlap in this meridian, it has the longer radius." Now, he is so clearly in error that the least observant can see it at a glance. If you approximate these reflectors in a less curved meridian and then turn them to a more curved meridian of the cornea they *cannot separate*, but must *overlap* in order to be reflected from the cornea. Unfortunately, this grave error is emphasized as correct when applied to the 1889 model, as seen in a footnote on p. 258. All of the Javal ophthalmometers work on the same principles. On the same page we also note reference to Davis, who is quoted by Dr. Oliver as follows: "Davis says that the so-called 'primary position,' or position which represents that point at which the transverse lines of the reflectors become continuous, is the first to establish. To get this position properly and systematically he places the long white pointer horizontally. If the lines are coincident the primary position has been obtained. If not, the tube is to be revolved from right to left, for about forty-five degrees, and the same distance from left to right, thus causing the pointer to travel about forty-five degrees above and below the horizontal meridian." What Davis really says is: "To obtain the primary position first turn the long indicator to 0° ; if the transverse lines are coincident at this point go no further—that is the primary position. If not coincident at the zero point turn the tube from right to left—that is, the long indicator from 0° to 135° ; if the transverse lines do not become coincident before or when 135° is reached go no further in that direction, but turn back to zero, turning this time from left to right toward 45° ; the lines will necessarily become coincident before 45° is reached. The primary position is never further than 45° on either side of zero degrees."

Further errors in quotation from Davis are noticed, as: "Davis says astigmatism with the rule may be written 2. D. $90^\circ +$ or 180° ; and astigmatism against the rule, 2. D. $180^\circ +$ or 90° ." When correctly quoted it should be "astigmatism with the rule 2. D. $90^\circ +$, or $180^\circ -$ (minus); astigmatism against the rule, 2. D. $180^\circ +$ or $90^\circ -$ (minus)." We trust that these mistakes will be corrected in the next edition.

We were at a loss to know how such errors as those pointed out could occur, if the author was in the daily habit of using the ophthalmometer; but we find the solution of the difficulty, for on turning the page to the next chapter, which treats of the "Correction of Errors of Refraction and Accommodation," we read: "Having, then, assumed that a mydriatic is to be employed, the next point is, What one shall be used?" Again, "Although these plans may often result in patients seeking advice from others who may rest content with an imperfect correction of some

manifest error, yet in all such instances it is far more than equivalent recompense to know that the steady, quiet reputation of many years of but little error in refraction-work is infinitely better than the flash-like brilliancy of the moment in quickly giving corrections that may or may not be right." We are informed that atropine "will not be necessary in aphakia."

This whole chapter shows that the author is in the habit of using atropine as a mydriatic in all cases of error of refraction, even in the aged, for he says: "These latter cases may frequently be fairly well estimated with an extremely weak and evanescent solution of one of the drugs sufficiently repeated to make almost certain the result." We certainly do not have to resort to these methods in our practice, and our citizens are fairly well spectacled. We are particularly well pleased with the section dealing with the ocular muscles and the numerous tests for the detection of muscular insufficiencies.

Part II., *Diseases of the Eye*, by Dr. Norris, is embraced in three hundred and forty-one pages. His style is pleasing and particularly clear, although at times we find fault with him for not saying enough on a given subject; it is probably for a good reason. Chapters on diseases of the conjunctiva and cornea treat of these in the usual way, and nothing specially new is added.

Chapter XV., "Diseases of the Sclera." All that the author has to say on this subject is told on one page, when we think much more might have been added.

Then follow Chapters XVII. and XVIII., "Accommodation" and "Errors of Refraction." It is easy to see here that the senior editor is also imbued with the idea that no error of refraction can be properly corrected without the use of a mydriatic. In reference to the ophthalmometer he says: "However, the results obtained by it have usually failed to agree accurately with those arrived at by the use of test lenses."

The chapters on internal diseases of the eye are all good, but call for no special comment. Particularly full and interesting is Chapter XXIV., "Glaucoma." We fail, however, to notice any reference to the use of eserine sulphate as a means of treatment independent of iridectomy; we certainly believe many acute attacks can be cut short by the use of eserine alone.

The succeeding chapter, "Affections of the Eye Muscles," is exceedingly interesting and the plan of treatment advised orthodox and to be followed by all practical surgeons.

Chapter XXIX., and last, "Operations on the Eye," is well illustrated and the text fairly full. Antiseptic surgery is advised in its practical form and not as a fad, and all of the operations detailed are of the most modern. Especially clear are the remarks on "Ectropion," and with the numerous plates presented make the subject full in every particular. Dr. Norris, in speaking of "graduated tenotomy," says: "That it is difficult to accurately foresee any desired effect is evident from the number of times that even experts in the method are obliged to repeat the procedure." This hits the nail on the head—they do not know, but attack one muscle after the other. We are glad to see the author's idea so clear on this subject.

All that is said on the subject of extraction of cataract we can cordially commend and are fully in accord with; it is safe and good teaching. An

index and full set of test-letters conclude the volume. The work is gotten out by the publishers in very good form and makes an attractive-looking volume. We shall look soon for a second edition, when any defects pointed out may be corrected.

W. O. M.

ÉTUDES DE CHIRURGIE MÉDULLAIRE. Par A. CHIPAULT. Svo., pp. vi., 403. Paris: Felix Alcan, 1894.

STUDIES IN SPINAL SURGERY.

It is not often that one comes across such a treasure-house as this admirable book on Spinal Surgery by the well-known French surgeon. Those who have read the *Revue de Chirurgie* and *de Neurologie*, as well as other journals, know very well the many contributions to surgical literature, especially to that of the spine, which he has already given to the public, but it is still a surprise to see how complete this portion of the work in question is, and especially will be when entirely finished. This is the first part of a work to be completed in either three or four volumes. The present volume includes the History, Technique, and Indications. The second, now in press, treats of the Diagnosis of Spinal Lesions, and the third, and possibly a fourth, will take up, in detail, Fractures, Pott's disease, Spinal Fistulæ, Tumors, Spina Bifida, Curvatures, etc.

The author has none of the national seclusion which is so frequently characteristic of French writers. One sees constantly books from which it would be supposed that surgery began and ended within the boundaries of the French Republic, but in the present work not only are German and English authors constantly quoted, but all the well-known American surgeons appear in its pages. There seems to have been hardly even the Transactions of an American State Medical Society that he has not searched and extracted all of value in it. So far as the reviewer is aware, no important case and no important paper from an American author has been overlooked; and strange to say, the only misprint of an American name (p. 155) is that of McCosh, who appears as "M. Cosh." The illustrations also are admirable, and are taken freely from foreign as well as French authors. On p. 30 he figures a dural needle identical with one devised some years ago by the reviewer (Buck's *Reference Handbook of the Medical Sciences*, vol. viii. p. 210), but abandoned in favor of the smallest Hagedorn semicircular needle.

He points out and illustrates by a good woodcut (Fig. 13) that the posterior surface of the bodies of the vertebræ can be reached by drawing the spinal cord aside, and it is probable that in view of the elasticity of the roots of the spinal nerves operators have often been too timid in thus displacing the cord by suitable retractors.

In cases of vertebral abscess he approves very strongly of Treves' method in the lumbar region, which in fact has now become, one might say, classic. In the dorsal region he quotes the bold, and almost rash, proposal of Vincent for trans-somatic vertebral and pre-medullary drainage, and in the cervical region gives his hearty approval, as seems just, to the antiseptic method of reaching a post-pharyngeal abscess by an incision along the anterior or posterior border of the sterno-cleido-mastoid muscle, rather than through the mouth.

For the treatment of hydrocephalus by indirect drainage through the spine, he proposes, and with a certain amount of reason, puncture of the spinal envelope at the lumbo-sacral junction, between the fifth lumbar and the first sacral vertebræ, instead of that of Quinke, between the third and fourth. Parkin's more recent method for the relief of intra-cranial pressure by the withdrawal of cerebro spinal fluid from the basal sub-arachnoid space (*Lancet*, July 1, 1893) is not included in this chapter, since it was published undoubtedly too late to be included. Not only has he gathered together a large number of cases, but he has evidently studied them with care and good judgment, and with his conclusions we can rarely differ.

Thus in fractures implicating the cauda equina, his conclusions are: "1. In fractures of the lumbar or sacral vertebræ, with irreducible displacement of the fragments, immediate interference should be the rule. 2. In fractures reduced spontaneously or by surgical manipulation, wait. If the course of the accident is progressively toward health, abstain from intervention. If the case is stationary, intervention by the end of the first month is proper; not earlier, for the restoration of function cannot begin before this period; not much later, since incurable degenerations of the spine may be established" (p. 71). In the cauda equina he also rightly advocates suture of the nerves if it be needed. And again: "In complete fractures of the vertebræ with persistent compression of the cord between the body and the lamina, surgical interference has only resulted beneficially when it has been made very early, and in traumatism of the inferior part of the spine and not its superior portion, and also in case the cord has simply been compressed and not destroyed" (pp. 102, 103). And again, in fractures of laminæ at any level, laminectomy (as, following Lloyd, he proposes to spell it) is to be done, with the removal of any extra-dural clots.

Following this chapter on traumatism is a table of one hundred and sixty-seven cases of laminectomy in fractures, and a second table of eight cases of surgical operations other than laminectomy in fracture, and a third of one hundred and four cases of surgical interference for gunshot wound, practically covering all the modern literature of these cases.

In Pott's disease with paraplegia, his conclusion is that surgical interference should be much restricted. The results have been far from giving that which had been hoped, and he would restrict it to special and rather rare varieties of pathological change, such as paraplegia from cold abscess, from direct compression of the medulla by granulation tissue, and paraplegia with perimeningitis, which has resulted in a permanent sclerosis. In addition to this restriction, the contra-indications from bad general health of the patient, from the extent of the osseous lesion, and intra-meningeal tubercular infection, should ever be borne in mind. Following this also is a table of fifty-nine cases of operation in Pott's disease without paraplegia, and another of one hundred and three cases of laminectomy in Pott's disease with paraplegia.

Of spinal tumors he gives a table of twenty-two cases which have come to operation, and his conclusions are in favor of operation in case the disease is not malignant or disseminated; but he promises in a future volume to enter into this matter much more fully.

Following these chapters are some interesting observations of varied character, including one excellent case of his own (p. 367) of osteomyelitis of the body of a lumbar vertebra, with complete and durable

cure resulting from operation. To the intra-spinal resection of the nerve roots he gives a guarded approval, based on the very few cases thus far recorded, two of Abbe's, two of Horsley's, and one of Bennett's.

The book has one characteristically French, and very grave, defect; there is a table of contents, but *absolutely no index*. We are constantly surprised at the neglect of French authors to put in any indices whatever. German and especially English and American books have full indices, so that one can refer instantly to any topic, and very frequently, especially in German books, to the remarks or cases of any author; but to find a French book with an index is a rare pleasure. Each volume of this series, being issued separately, should have an index, and we especially urge that when the work is completed there shall be a full and complete index of all the volumes.

W. W. K.

SYLLABUS OF LECTURES ON THE PRACTICE OF SURGERY, ARRANGED IN CONFORMITY WITH THE "AMERICAN TEXT-BOOK OF SURGERY." By N. SENN, M.D., Ph.D., LL.D. Pp. 221. Philadelphia: W. B. Saunders, 1893.

THIS excellent little Syllabus of Surgery is intended more especially for teachers and students. The idea of the author is that the teacher will find it useful as a skeleton for his lectures, and the student as a series of headings from which he can quickly refresh his mind in preparing for a quiz. The author has added a few facts, names of authors, and operations.

The book is imperfect in one respect, that it does not cover all of the American Text-book of Surgery; the first part, which treats especially of the Principles of Surgery, being excluded. We hope this defect will be remedied when another edition is called for, as it undoubtedly will be. The work is certainly one involving great labor, and at the same time is extremely clear, both by its mechanical arrangement and its textual exactness. Those who use the American Text-book of Surgery as a text-book will find it very useful.

W. W. K.

THEORY AND PRACTICE OF MEDICINE. By JAMES T. WHITTAKER, M.D., LL.D. 8vo., pp. 821. Wm. Wood & Co., 1893.

THE keynote of the book is *infection*. From the dedication to Robert Koch, "founder of bacteriology," and to George M. Sternberg, "pioneer in the study of parasitism in this country," through the whole of the subject-matter sounds the one tone. The author promises in the preface that morbid anatomy shall receive but little consideration, and keeps his promise well. Treatment, too, does not have much attention as compared with the study of the causes of disease.

The volume is one of 821 pages, including the index. It is well printed on good paper, and is provided with 300 excellent illustrations and a colored plate. It is impossible to review all the sections in detail,

even were it desirable, and we must confine ourselves chiefly to the plan of the book and the methods of handling the subjects which the author adopts.

Contrary to the arrangement common in text-books of medicine, the first portion is devoted to the ectozoa and the entozoa. These two chapters are particularly interesting and instructive, and the illustrations, so needful in the description of parasites of this kind, are extremely satisfactory.

After a short article upon bacteria are two chapters upon the infectious diseases. The section upon diphtheria, although short, is very complete. The author revives the etymological signification of "typhus," and describes typhoid, typhus, and recurrent fevers as subdivisions under the general heading of "the typhus fevers," although, of course, regarding them as distinct diseases. We are pleased to see that he condemns all forms of specific treatment for typhoid fever hitherto tried.

It is, perhaps, straining the state of our knowledge on the subject to place rheumatism and quinsy among the infectious diseases, except in so far as the latter is a suppurative process, which it is not always. This finishes Part I. of the book.

Part II. is devoted to diseases of the organs. Diseases of the mouth are much too briefly treated, considering the importance of the subject. The section on diseases of the stomach contains in a limited space a very excellent account of gastric affections. The condensation has been admirably done. We notice that the author rejects Ewald's use of the term "gastritis," choosing rather the title "gastric catarrh." This seems to us a step backward, since the catarrhs of the stomach are really gastritis as viewed from a pathological standpoint.

The remarks on the treatment of appendicitis are sensible and timely. We commend them to the consideration of those whose views upon this subject have become either all surgical or all medical.

Under diseases of the respiratory apparatus, bronchitis in its various forms is well handled. The author retains the title, capillary bronchitis, contrary to the view of many writers on the subject, which seems to us the correct one. Croupous pneumonia is included among the infectious disorders in the first part of the book, and catarrhal pneumonia among the respiratory diseases. This is somewhat confusing, especially, too, when we remember that a large proportion of the cases of catarrhal pneumonia are tubercular in nature, and consequently to be classed with the infectious disorders, although the symptoms of these cases cannot be distinguished from those of non-tubercular form. It would scarcely answer to describe in different parts of the book conditions which are clinically so identical; and the wide separation of croupous and catarrhal pneumonia seems equally ill-advised.

Remarks on drowning are included in the section on respiratory diseases.

What the author writes on diseases of the organs of circulation, of the blood, and of the genito-urinary apparatus is for the most part good. The classification, however, is confusing. Exophthalmic goitre and myxœdema are included in the first class, although it is doubtful whether they belong there. Gout and arthritis deformans are put down as diseases of the blood, although rheumatism is included among infectious diseases. Rickets and obesity also go under blood diseases, but diabetes mellitus and diabetes insipidus under genito-urinary affections, where they do not seem to belong.

The last portion of the book, that upon diseases of the nervous system, includes remarks upon poisoning by opium, cocaine, and nicotine, and a section upon congelation. The ordinary subjects of this department are, of course, contained in the work. The vastness of the subject and the limitations of the book make many of these latter articles rather sketchy.

Few tasks can be more difficult, with the constantly increasing amount of medical knowledge, than that of writing a text-book of medicine in a single volume without slighting any of the subjects contained in it.

Dr. Whittaker is an able writer and a careful worker, but his acknowledged method of approaching his subject is one-sided, and renders the book one which cannot be recommended to medical students or to physicians who wish to depend upon it as their chief guide. There is, too, a disposition shown to ignore statements of others which do not accord with the author's own views. For instance, no reference whatever is made to iron in the liver, or to the reddened marrow of the long bones as seen in pernicious anæmia. Then, too, it gives a wrong impression to say, *ex cathedra* and without a qualifying statement, that the chief cause of chlorosis is connected with some disturbance of ovulation, since this is far from being generally admitted.

Again, pseudo-leukæmia, which is described in nine lines, is not always believed to be "essentially the same" as leukæmia. Gout is described as though it were purely an affection of the joints, and no more than an implied reference is made to the various other ways in which it may affect the system. Phosphorus is referred to as though it were a certain, unfailing specific for rickets, and no allusion is made to the fact that this is a greatly disputed point, with certainly as much evidence against it as for it.

Yet the book is a good one, and we can heartily recommend it as a work of reference. Our criticisms are made in no censorious spirit, but because we feel that a text-book for students and younger practitioners should teach that which is most generally accepted rather than that which is more of an individual opinion. A little changing and filling in here and there in a second edition will make the volume all that can be desired.

C. G.

A HANDBOOK OF OPHTHALMIC SCIENCE AND PRACTICE. By HENRY E. JULER, F.R.C.S. With illustrations. Second edition. Philadelphia: Lea Brothers & Co., 1893.

MR. JULER'S *Handbook of Ophthalmic Science and Practice* has been well and favorably known since it appeared, about nine years ago. One of the marked features in the first edition of the work—its liberal number of illustrations—is continued and elaborated in the second with two hundred and one woodcuts, a number of chromo-lithographic plates, and twenty-four reproductions of photo-micrographs. A few of these—for example, Fig. 37, representing a corneal cicatrix—are fairly representative of the lesion which they are intended to illustrate; but many are of indifferent value. It is greatly to be regretted that handsome work in photo-micrography loses so much in reproduction, the chief fault

being the failure to portray detail of the structure. A student endeavoring to learn the histological appearances of the normal cornea from Fig. 30 would be possessed of ideas as hazy and indistinct as is the cut from which he would try to obtain them. It really seems, until we find a better method for reproducing photo-micrographs, that it would be more satisfactory to retain drawings, even if these were diagrammatic.

The new material in this second edition is considerable, amounting to nearly one hundred pages, and there is scarcely a subject which has escaped careful and satisfactory supervision. Occasionally, however, we are struck with the omission of certain interesting ophthalmic topics—for example, retinal changes as the result of direct sunlight, traumatic amblyopias, or retinal concussion, and the meagre consideration of toxic amblyopias, among which tobacco and alcohol are practically the only ones receiving attention, and even in these, although the clinical side is well represented, there is no description of the pathological anatomy of the affection or of the interesting relation of the bundles of the optic nerve, such as the papillo-macular fibres, to the development of variously-placed scotomas in the visual field.

Some liberty, probably the fault of proof-reading, is taken with the names of authors. Our own accomplished New York ophthalmologist, Dr. Weeks, appears as *Weeks*, and in the somewhat unwieldy name of Wickerkiewicz the last *c* is substituted by a *t*, while Schneller appears as Schweller.

Affections of the eyelids, introduced with a good account of the anatomy and physiology of the palpebræ, is a satisfactory chapter in the main, although separation of the varieties of blepharitis into those which are eczematous, seborrhœic, etc., would be preferable to the consideration of the subject under one heading.

Diseases of the lacrymal apparatus are discussed in a brief chapter—too brief, perhaps, considering the stubborn character of many of the affections and their relation to intra-nasal surgery.

There is a good classification of inflammations of the conjunctiva, and under “granular lids” we find, in addition to the ordinary medicinal applications, some reference to the modern surgery, or rather, the modern modifications of surgery applicable to this disease. Darier’s method is described and recommended as better than galvano-cautery applications, but there is no mention of Knapp’s forceps, nor description of any of the varieties of the operation of expression. While it is true that pinguicula ordinarily causes no trouble or inconvenience, yet in the light of the researches of Fuchs, its relation to the development of pterygium, and the relation of this lesion to operations on the eye and to changes in the curvature of the cornea, should receive more direct mention.

Diseases of the cornea are well discussed, and with the exception of a failure to include the researches of modern times, particularly those of Leber, in regard to infectious keratitis, are clearly, easily, and practically considered. The optical treatment of conical cornea is referred to, but in this, as in other books, scarcely enough attention is paid to its value. In view of the experiences of Thomson and Wallace as to the improvement of visual acuity possible with strong sphero-cylindrical combinations in certain cases, it is well to impress the student that he should not lightly turn down a case of this kind as unsuited to optical therapeutics before, with shadow-test, ophthalmometer, and careful test-

ing with the trial lenses, he has endeavored to raise, as he often may, the visual acuity to an unexpected sharpness.

Diseases of the iris, ciliary body, and choroid, are considered in Chapter VI., and are well described, several new varieties of iritis receiving considerable attention. Sympathetic irritation and sympathetic ophthalmitis are very properly considered as separate affections, and the dangers attendant upon the last-named disease are fully impressed. Mr. Juler is not willing to commit himself to any theory of the mode of production of sympathetic disease, or the path of the morbid process. He believes that "the known facts about the occurrence of sympathetic ophthalmitis are hardly yet sufficient to establish a theory as to its mode of transmission." This chapter is illustrated by many useful chromolithographs and satisfactory woodcuts.

Chapter X., on color vision and its defects, is written by Mr. Adams Frost, and is an exceedingly satisfactory description of the subject, illustrated by a colored plate of the tests for color-blindness after Holmgren.

There is a good, well-illustrated chapter on the crystalline lens and its diseases. Mr. Juler adopts, in suitable cases, the following incision for extracting cataract: "The puncture and counter-puncture are made in the sclerotic at 1 mm. from the edge of the cornea and 3 mm. below its upper tangent; the knife is brought out through the sclerotic immediately above the cornea." Evidently a similar incision is practised in the operation without iridectomy, for we read: "The incision is made in the same way as in the former operation." Perhaps this accounts for his opinion of simple extraction, somewhat vaguely summed up in the following paragraph: "This is not the place to discuss the points in favor of or against such a procedure, beyond mentioning that optical results without iridectomy are decidedly better should the operation be successful; but the liability to anterior synechia, prolapse of the iris, involvement of iris in the cicatrix, with irido-cyclitis, is sufficient to raise doubts as to which is the better procedure." So, too, he prefers not to commit himself as to the propriety of instilling eserine before and after operations for cataract, being content to state that some surgeons instil it and some do not. Irrigation, or washing out of the anterior chamber is recommended when careful toilet of the wound has failed to rid the anterior chamber of the remains of lens-matter. The author's experience is that harm does not attend this practice and that its value cannot be doubted—this in spite of the fact that he uses boiled distilled water, although the researches of Mellinger have shown that even this fluid is capable of originating opacities in the corneal endothelium.

No one can accuse Mr. Juler of allowing undue liberty to his cataract cases: Both eyes are bandaged, the patient put to bed in a darkened room, and the bandage not permanently removed until the twelfth day. In combined extraction the eye, other things being equal, is first examined on the third or fourth day; in simple extraction, inspection of the eye is considered imperative on the morning after the operation, and if there is prolapse, immediate iridectomy, because he believes that delay is almost certain to result in plastic iritis, and the entanglement to lead to recurrent iritis and to danger of sympathetic ophthalmitis. It is interesting in this connection to recall Knapp's experiences: Prolapse, recognized within a few hours of its occurrence, is cut off; prolapse found after the third or fourth day is not touched; if small it may

disappear, if large no operation is done until the eye is quiet, when the protrusion is amputated, and usually prompt recovery follows.

Although it is evident that Mr. Juler appreciates the value of aseptic surgery in its relations to ophthalmic operations, it is to be regretted that he has omitted specific directions for the preparation of patients, instruments, collyria, and dressings.

The chapter on refraction of the eye is written conjointly with Mr. John Griffith. In the former edition Mr. Adams Frost assisted in this work. It is a good chapter. The illustrations are clear and to the point, and although we do not agree with Mr. Juler that mydriatics are unnecessary after the thirtieth year, this is one of the many questions in ophthalmology which remain for the future to settle. The old numeration of prisms alone is considered, and there is no description of the centrad, the prism dioptry, or the large amount of work which recent times, and especially American industry and intelligence, have brought to bear upon this subject. Dr. Stevens's nomenclature of the insufficiencies of the ocular muscles is referred to; esophoria and exophoria are described, but, curiously enough, there is no mention of hyperphoria, and, we are glad to say, none of the so-called graduated tenotomies. The ophthalmometer of Javal finds place, but the old model is figured and the description of its value as an aid in detecting astigmatism is not very clear or practical.

A few defects have been mentioned existing in this work which, taken all in all, is one of the best in the English language. Mr. Juler has produced a text-book which we feel sure is bound to continue to receive recognition and to go through other editions, each one of which will make it more perfect than the last. We heartily commend it, and congratulate the author and those who have been associated with him in the preparation of this second edition.

G. E. DE S.

A MANUAL OF DISEASES OF THE EAR. By GEORGE P. FIELD, M.R.C.S.,
Aural Surgeon to St. Mary's Hospital, etc. Fourth edition. Philadelphia:
Lea Brothers & Co., 1893.

THIS compendious and well-illustrated volume of 371 pages is a natural follower and later development of the works of Toynbee and Hinton, well worthy of the popularity indicated by the exhaustion of the 3000 copies of the third edition. It shows pathological and literary research on the part of its author, not of the extreme sort which traces facts or statements beyond those citing them to their primary origin, especially if in untranslated German works; but the data are generally accurate and well enough authenticated, and it is refreshing to get away from the usual recurring quotation of German authorities. More important still is the distinct impression of the writer's personality in his frank statement of his own experience and his keen but ingenuous analysis of his facts. He plainly aims to furnish to others a guide from the teachings of his own practice rather than to construct a treatise of logical, but forced, completeness. This personal and British flavor of his book is not spoiled, as in some similar works, by evidence of insular prejudice and ignorance.

The general arrangement is systematic and fairly proportioned. The thirty-two pages devoted to the anatomy are clear and generally satisfactory, although the old errors are perpetuated in such statements as "The tympanic membrane slants somewhat . . . its surface looks outward and slightly downward and forward," which gives no true idea of the nearly horizontal position of the drum-head so manifest in the infant skull or that of the adult when similarly opened to view. After chapters of ten pages each, on the physiology and on the examination of patients—both showing mild skepticism as to the more hypothetical and fine-spun matters often set forth—the clinical portion begins with a good statement of the diseases of the external canal. He follows Toynbee in writing of "sebaceous or molluscular tumors" as arising in the meatus, sometimes involving and hollowing out the bone and even extending in to penetrate the cranial cavity. These are surely cholesteatomatous growths or collections forcing their way out from the cavities of the middle ear ten times as often as sebaceous cysts, such as he considers them. His teaching as to the danger of using any instrument other than the syringe for the removal of wax-masses or foreign bodies, is as vigorous as it should be; but the temperature of 100° for the water is generally too low and less efficient than 110° to 115°.

His fifth chapter, of nearly thirty pages, is devoted to a good statement as to the osseous tumors of the meatus and their operative removal. This is a matter in which his experience has been exceptionally rich, as witness more than a hundred operations on cases carefully selected from a much larger number. Private practice furnished almost all of them, for he says: "In common with other aurists, I have found the occurrence of an exostosis among hospital patients to be an almost unique phenomenon;" and constant bathing, especially in salt water, is charged with the production of the majority of them. Exostoses demanding operation are so rare outside of England that American readers are most concerned with his sage advice as to the forms which should be let alone.

After a brief chapter on affections of the auricle he takes up acute middle-ear inflammation, which he treats more often by hot douching and gentle Politzer inflation, with leeching in the worst cases and paracentesis when pus is diagnosticated and not soon dissipated. In the chronic non-suppurative disease the numberless measures employed in the nose, pharynx, and ears are well set forth, with little stress upon Hinton's plan of incising and syringing through the drum-head. The importance of post-nasal adenoid hypertrophies and the need of operative removal of enlarged faucial and pharyngeal tonsils, when less radical measures give only partial relief, are clearly stated, but he deprecates very zealous nasal surgery. Intra-tympanic injection of fluid per catheter has given very good results in his hands, the medication being carefully selected in accord with the condition indicated by auscultation and the appearance of the drum-head. In this connection should be mentioned the dozen colored plates of the tympanic membrane, which are effectively framed-in by the recurring picture of the auricle and speculum. The long axis of the oval of the speculum is nearly at right angles to that of the canal, in a position in which the speculum should not be used; and perhaps for this reason our prime landmark—the short process of the malleus—is hardly ever shown. That any of them are moderately good, marks the overcoming of very notable difficulties in this sort of illustration.

Operative intervention for catarrhal deafness finds little favor with Mr. Field; but his skeptical attitude seems partly due to a distrust which has restrained him from essaying it in many of its forms, and thus demonstrating its limited value. In spite of some disclaimer, he seems to regard a perforation as a certain impairment of the hearing, the artificial drum-head as valuable as a vibrator, and the removal of the stapes as nearly inevitably destructive of the hearing—points sufficiently disproved by modern workers, although they have failed to convince the profession of the value or the full safety of the latter procedure. In suppurative disease he regards caries as a clear indication for operation, by excision of ossicles, curetting of walls, laying open the attic and antrum from the meatus, or the opening of the mastoid. The trephining of the mastoid is fairly described, in terms that suggest that the author has rarely done it, except in enlarging a pre-existing sinus; and the dental engine is the instrument preferred because of the absence of jar.

The intra-cranial complications are treated in a chapter of nearly thirty pages, which deals with the British operative and statistical work upon the subject, and contains much of sage insight into the difficulties and uncertainties of diagnosis. A good chapter on pain in ear-disease is followed by those on affections of the internal ear and on tinnitus, in which the pilocarpine treatment is rather strongly advocated and the use of electricity as advised by Brenner. Then at the close, except for the brief chapters upon deaf-mutism and artificial aids to hearing, the author reviews the pathology of ear-disease in an excellent, comprehensive chapter, which gathers up many of the links, before but loosely joined in his informal discussion of the various topics, in a way that epitomizes and reiterates much of what has gone before. Placed in this final position, where the student who has gained some understanding of the details of otology from the very readable preceding sections is prepared to receive it intelligently, such a summary is likely to fasten much of the author's teaching in the mind, to simplify and unite the subject as a whole, and thus to stir the reader to renewed and increasing interest.

B. A. R.

A TREATISE, PRACTICAL AND THEORETIC, ON CANCERS AND THE CANCER-PROCESS. By HERBERT SNOW, M.D. (Lond.), etc., Surgeon to the Cancer Hospital. Pp. xiii., 384. London: J. & C. Churchill, 1893.

DR. SNOW is already widely known through his contributions to the literature of malignant disease, considered from both a clinical and a theoretical standpoint. His connection with the oldest hospital devoted to this special branch of surgery has given him unusual opportunities for studying it. Under the term "cancer" the reader should bear in mind that he includes also the various forms of sarcoma. The scope of the monograph is clearly outlined in the preface, in which the author states that it is divided into three portions, the first being devoted to classification and general considerations, the second to structural anatomy and the "clinical career of particular species;" the third to the peculiarities of malignant disease affecting different organs, with a review of the proper therapeutic measures. The main object aimed at is stated to be

"to make clear *principles and laws*, rather than to rest content with chronicling bare facts."

Part I., containing nine short chapters, includes a general discussion of the etiology and phenomena of malignant disease. It is based largely upon the author's previous writings, and is filled with interesting and suggestive facts and deductions.

Chapter I., on the nature of cancer, concludes with a denial of the parasitic theory. "Cancer," it is affirmed, "is not introduced from without, but is the product of agencies within; no microbic parasite is to be sought, but the cell-elements of the body, under the influence of some mysterious force, themselves become autosites." The phenomena of *erosion*, together with *infectivity* of the cell element, are the distinguishing characteristics of malignant disease. The possibility of the existence of a specific microbe is denied at the outset from the entire absence of proof. The author affirms that there is no authentic instance of the transmission of cancer by contagion.

The general denial of the constitutional origin of cancer is offset by the statement that "we note as a common clinical fact the purely local character of all the early manifestations, with what is also a matter of everyday experience(?), the generation of carcinoma solely by distress of mind." It is certainly wise (as the author remarks) that the explanation of this phenomenon should be left to "a future generation," who will doubtless find it a hard nut to crack.

The influence of heredity, climate, and food is dismissed as an erroneous idea, while it is shown that with advancing civilization malignant disease is steadily on the increase—a fact attributed by the author to the less robust physique of the present generation, an argument which will hardly be convincing to those who have studied the development of the disease among our foreign population, where the author's favorite neurotic theory loses its force.

Part II. deals with the varieties of carcinoma and sarcoma, including their morbid anatomy. Sarcoma is defined as "cancer originating in the cells (corpuscles) of the connective tissue." "Lympho-sarcoma" and "lympho-carcinoma" are regarded as synonymous terms.

Part III., on cancer in special organs, is introduced by two general chapters on diagnosis and treatment. An italicized sentence under the latter head is worthy of remembrance, viz.: "For every surgeon who is called on to perform an operation for cancer it should be a maxim that *with such a measure the proper treatment of the case is only commencing.*" This is advice which the surgeon would do well to bear in mind in his estimate of the permanent results of operations for malignant disease.

The early use of opium is strongly advised, since the author holds that aside from its analgesic effects, the drug actually "appears to exert a direct and conspicuous retardative action, materially checking the cell-growth in both the primary tumor and in secondary metastases."

A number of beautifully colored plates are found at the end of the volume, also a valuable appendix and carefully prepared index and table of authorities. The book contains a large number of interesting clinical facts, the results of the author's personal observation and collation, and though the reader may not always agree with the deductions which are made, he cannot withhold his admiration at the ingenuity and originality with which the arguments are presented. As a speculative treatise on malignant disease it is worthy of careful perusal.

H. C. C.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE
MEDICAL SCHOOL AND HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

PYRIDINE.

DR. BLANC presents a careful study of this singular alkaloid. Possessing the formula C_5H_5N , it is a colorless, very fluid substance, of an excessively penetrating odor. Soluble in water and in alcohol in all proportions, it also yields crystalline salts which are, as well, soluble in these liquids. If inhaled in small doses it produces slight somnolence, headache, with congestion of the face and sometimes a little vertigo. The inspiration acquires a remarkable amplitude, the blood pressure diminishes, and there is a general vasodilatation. The excito-motor power of the medulla and spinal cord is profoundly changed, in that their excitability is calmed. The bronchial secretion is somewhat increased. Its absorption by the air-passages is rapid, and its elimination by the urine almost equally so, for it is complete within fifteen minutes; it is also eliminated by the lungs, the glandular apparatus of the digestive tract, increasing the gastric secretion, and thus exciting the appetite and favoring digestion. This rapid elimination permits the use of enormous doses with perfect safety. It has also some antiseptic properties, and since it is not irritant, it can be used, as has been shown by Jullien, in from one to ten per cent. solution, in the treatment of urethral blennorrhœas in the male and female. Its most important use, however, is for the treatment of asthma and emphysema. Adopting the theory of Sée, that the former is a neurosis whose seat is in the medulla, in a state of excitability, reflex from very diverse peripheral irritation—pneumogastric, trifacial, even olfactory—and acting upon the motor nerves of the inspiratory muscles, particularly the diaphragm. Under the influence of this drug the respiration becomes free, the expectoration more fluid, and loses its purulence and foulness. Auscultation determines that the sibilant râles disappear and are replaced by the mucous ones. Even in cardiac asthma the remedy is preferable to morphine,

although for continued relief the treatment must be based upon iodide of potassium. It is useful in angina pectoris, because its vaso-dilating effect extends to the coronary arteries, and it should be used by inhalation for fifteen minutes each morning and night. Daudier has reported benefit from its inhalation in subacute traumatic tetanus. Although it is best used by inhalation for twenty minutes from a napkin upon which is poured several drops, it can be administered by the mouth in capsules. If used for urethritis, a tampon moistened in a one to ten per cent. aqueous solution can be applied to the meatus, or an injection of the same strength can be administered.—*Revue de Thérapeutique Médico-chirurgicale*, 1894, No. 1, p. 20.

[Although we have used this remedy with brilliant success in several cases in which the symptom of asthma demanded immediate relief, we have never been able to induce a patient to inhale it for a second attack because of its abominable, penetrating, and lasting odor.—R. W. W.]

FREEZING THE VAGI FOR ASTHMA.

DR. ERNEST B. SANGREE, having made a patient comfortable by the use of one-half drop of a one per cent. solution of nitroglycerin every half-hour, found that when the remedy was exhausted the attack immediately regained its former severity. If the remedy was continued the patient could not lie down and was able to obtain only a few minutes of fitful sleep. Small pieces of ice wrapped in a towel and applied over the course of the pneumogastric in the neck was successful within five minutes in relieving the attack.—*The American Therapist*, 1893, No. 5. p. 143.

THE TREATMENT OF INFECTIOUS BRONCHITIS.

DR. HENRI HUCHARD divides these cases into three classes: 1. The infection takes place from contagion, that is, by direct contact of microbes already virulent; then isolation is necessary. 2. The infection takes place by exaltation of the virulence of microbes pre-existing in the upper air-passages; here it is necessary to attack early and energetically the fermentations of the mouth, which so frequently exalt the virulence of the streptococcus; for example, frequent washings of the mouth with solutions of boric acid, carbolic acid, or resorcin. 3. In the bronchi the microbes of suppuration or putrefaction exalt the virulence of the streptococcus; here it is necessary to obtain bronchial antiseptics by means of creosote, eucalyptol, camphorated guaiacol (guaiacol, 5; camphor, 20; sterilized oil, 100); the creosote in oil (1:15), and the camphorated guaiacol are used subcutaneously. If the infection has done its work, with the camphorated injections those of ether or caffeine should be used in addition.—*Revue gén. de Clinique et de Thérapeutique*, 1893, No. 42, p. 659.

THE TREATMENT OF THE FEVER OF PHTHISIS.

DR. SAVIGNY distinguishes three forms in this disease: 1, the initial or continued; 2, the hectic or concomitant; 3, the septic. In the last form the purely symptomatic treatment is powerless. The administration of the new antipyretics is not favorable, for all of them diminish the energy of the

heart, only influencing the fever as a symptom, if indeed they have any notable effect, and they are only used in rapid tuberculosis, and when humanity demands only that the patient shall be made more comfortable. Hochhalt, after much research, has come back again to arsenic, but with the exception of recent initial apical catarrhs it has no influence upon the course of the disease. Hectic fever is manifestly influenced by this remedy, but it has no action upon the initial fever and upon the rapid forms of phthisis. Fowler's solution is recommended, in commencing doses of one to two drops, and increasing, day by day, to five or six; rarely more, for ten drops is quite likely to produce symptoms of poisoning. Other beneficial effects besides the lowering of temperature are the suppression of night-sweats and an increase of appetite and body weight. The continued fever offers considerable resistance to the treatment by arsenic, for this fever is a manifestation of caseation, and is an expression of the clinical form of *phthisis florida*. By building up the system one can best combat the tendency to caseation. In these cases the condition of the heart and circulation is important; Brehmer and Dettweiler recommend the prolonged application of ice-bags; others use alcohol. Kühle and Liebermeister advise digitalis, which, however, should be used with caution; but more advantageously the ten per cent. tincture of coronilla, in ten to twenty-drop doses, can be employed. In cases of initial fever without grave lesion of tissue, in association with fifteen grains of quinine, Hochhalt has seen this fever transformed into the intermittent type, where arsenical treatment is useful. In apyretic phthisis creosote is used; if at the outset it is not well borne by the stomach, it can be administered in cocoa-butter suppositories—with steady increase of all doses; in commencing with large doses there is danger of exciting the fever. In general the antipyretic treatment consists less in reliance upon the antifebrile remedies, properly so called, which have only a slight and transitory effect, as in the use of remedies which act directly upon diseased pulmonary tissue, than upon arsenic, the cardiac tonics, and nutrition by every means which can stimulate it.—*Revue de Thérapeutique Médico-chirurgicale*, 1893, No. 22, p. 598.

GUAIACOL AS AN ANTIPYRETIC.

M. L. GUINARD has made use of this remedy by painting it upon the skin. His work has been very carefully carried out, and from it he has reached the following conclusions: The lowering of temperature which is determined by the painting of this drug upon any region of the body is not the result of absorption, because this fall takes place too rapidly. Experiments upon animals show that it acts upon the centres of thermogenesis by exciting the peripheral nerve terminations, and thus reflexly upon the functions of the centres. The presence of the drug in the urine shows that it has entered by way of the respiratory passages, because, if it is excluded from them, it is not found in the urine. The quantity of vapor which can be absorbed in this way is not sufficient of itself to produce this fall of temperature. In the local or general effects of the remedy it is necessary to consider its quality, the individual susceptibility of the subject, and the condition of his health. In febrile cases the diminution of temperature is more

noticeable than in non-febrile individuals. With the last, however, especially when the drug is irritant and when the individual possesses a particular susceptibility of the skin, as in the rabbit, its action may be manifest. The effects are more marked and more intense when the painted region is protected from the air by an impermeable covering. The use of guaiacol in this way represents an original therapeutic measure, simple and convenient, which may render great service when its indications have been determined by a larger number of clinical experiments.—*Bulletin gén. de Thérapeutique*, 1893, 40e liv., p. 339.

ORGANOTHERAPY.

DR. MAX KAHANE presents a very scholarly and timely paper upon this subject: 1. The use of organic tissues and of their extracts, as well as of organic juices for therapeutic purposes, is based upon a rational physiological and experimental pathological foundation which warrants further research. 2. The use of definite glandular extracts for therapeutic purposes and the incorporation of the same in the diseased organism, in which the analogous glands—that is, their products—are wanting, is based upon the new researches concerning the significance of these glands for the organism, and proceeds from the correct theory that the missing products can be restored by the analogously acting products of another healthy organism. 3. The Brown-Séquard injection of testicular juice, as well as the so-called nerve transfusion, is by no means based upon a rational foundation; and it is more than likely that the real therapeutic results—even if the suggestion, which is sure to be present, is taken into account—warrant only the most humble expectations, and that their results may be just as slight in cases of organic disease of the central nervous system as with non-organic methods. This is despite the fact that there has been ascribed to them a capability transcending such physiological effectivity as is explainable. 4. The investigations of extracts of other tissues limit themselves almost exclusively to experiments upon animals, and we cannot, from the standpoint of their therapeutic value at this time, make any definite statement.—*Centralblatt für die gesammte Therapie*, 1893, Heft 11, S. 641; Heft 12, S. 705.

A NEW PROCEDURE OF METALLOSCOPY WITH THE AID OF A HYPNOTIZED SUBJECT.

DR. MORICOURT states that in hypnotized subjects we may find an exaggeration of sensibility during the period of somnambulism which permits them to feel, in some minutes, the effect of the metals, and that during the period of lethargy the neuro-muscular hyperexcitability permits them to appreciate the aptitude, more or less great, of the different metals to contract the different muscles of the face, or to contractures of the muscles of the limbs. But since all subjects cannot be hypnotized, the new method consists in placing a hypnotized person in contact with the one whose idiosyncrasy toward metals it is desired to know. A person upon whom metals acted only after some hours was placed in contact (hands) with a hypnotized subject, and the application of different metals (copper, tin) to the patient was followed by a speedy impressionability to metals which has since remained.

The patient was neuropathic to a great degree, but her sensitiveness to heat, draughts of air, and gastric symptoms disappeared. It is evident, then, that a latent aptitude for the metals can be awakened by contact with a hypnotized person, and that this person may communicate by contact this impressionability.—*Répertoire de Thérapeutique*, 1893, No. 11, p. 440.

THE USE OF CODEINE.

DR. VLADIMIR PREININGER discusses this drug from the standpoint of its being a substitute for morphine. He employs it either in powder form with cane-sugar, or in solution with glycerin, distilled water, and syrup. The dose is about one-half of a grain. In insomnia not dependent upon pain it is not reliable, and should sleep be obtained it is only for one or two hours. If the sleep is prevented by pain, codeine will not relieve this symptom, as it only mitigates the latter. In tuberculosis with painful cough, knife-like pains in chest, in the back, and between the shoulder-blades, this drug acts analogously to morphine. This statement is also true for chronic bronchitis. As to whether it will not, after continued use, produce dyspeptic symptoms, it can only be affirmed that it does not. In some cases it apparently relieves these symptoms, and thus confirms Kahler's statement that it has no untoward effect upon the organs of digestion. In acute bronchitis in adults, the irritation was diminished and expectoration followed without pain. In children the results were unfavorable in two cases out of three. In whooping-cough the best result followed in ten apparently severe cases. In two cases of neuralgic pains of the lower extremity, hypodermatic injection was of less effect than morphine. It is yet an open question, however, whether after prolonged subcutaneous use a codeinism could be developed similar to morphinism. It may be possible that there is an antagonism between these drugs, so that, if a codeinism exist, it may be restrained by morphine. And in morphinism codeine may be useful, or indeed indispensable. So far as the present observations go, after prolonged use, no unpleasant or untoward results have been noted, and since this is so it may be of more value than morphine. If, indeed, it is not to be considered as a substitute for morphine, it is a remedy *sui generis*.—*Therapeutische Monatshefte*, 1893, Heft 10, S. 498.

DR. ALOIS POLLAK concludes that (1) this drug is by no means an inactive remedy, in that poisonous symptoms have appeared from one-grain doses; (2) it is a very serviceable narcotic, but nothing beyond, for it is not a remedy for any disease; (3) it is not to be recommended for painful diseases, as sciatica, or a phlegmon; (4) no noteworthy action on the psychic or the nervous system has been observed in cases of withdrawal of alcohol, morphine, arsenic—it has been without result, indeed an accustoming to the remedy; (5) in inflammation of the female genitalia no result has followed its administration, and further investigation must determine whether it is of advantage to use it after the severe pain has been relieved by morphine; (6) codeine gives good results in most diseases of the organs of respiration, certain affections of the alimentary canal, and perhaps in inflammations of the urinary passages.—*Therapeutische Monatshefte*, 1893, Heft 11, S. 545; Heft 12, S. 599.

OLIVE OIL IN THE TREATMENT OF GASTRIC ULCER.

DR. EMANUEL G. SENN believes that this condition in the great majority of cases is the result of increased acidity of the gastric juice upon an enfeebled area. He administers large doses of the oil to lubricate the denuded surface, decrease friction, and prevent contact with the irritating effects of the abnormal gastric juice. The oil apparently favors coagulation of blood in the stomach. A single case is reported in which success followed the administration of a tablespoonful of the oil every two hours.—*The Chicago Clinical Review*, 1894, No. 4, p. 232.

THE USE OF OLIVE OIL IN THE TREATMENT OF NEPHRITIC COLIC.

DR. AUSSILLOUX believes that one of four theories must be held in regard to its mode of action: 1, direct action upon the calculus; 2, cholagogue action; 3, purgative action; 4, reflex action. The first appears to be with difficulty tenable, because there is not any evidence that the oil reaches the stone, and further, if they are immersed in oil, they do not change their appearance or consistence. The cholagogue action is more satisfactory, for the bile, secreted in abundance, may accumulate behind the stone and thus carry it forward. Yet other cholagogues do not so act, and the relief comes too soon for this effect to be established. Its purgative action does not entirely account for its value as a remedy, for other more active purgatives do not succeed as well as this. In fine, one must resort to the explanation of Weil, that it has an analgesic effect upon the alimentary canal in that it stops the spasm of the biliary passages; later its cholagogue action favors the descent of the calculus. If, then, it can act in hepatic colic by relieving the spasm, so it should also act in nephritic colic. Two successful cases are reported. The dose formerly recommended was large, even six or eight ounces. The author regards these as unnecessarily large. Several dessertspoonfuls may be taken at intervals more or less long, the mouth being rinsed before and after the dose with an alcoholic solution of mint. Olive oil has been popularly used from time immemorial for all sorts of abdominal pains, and it is possible that scientific experiment will justify the popular empiricism.—*Bulletin gén. de Thérapeutique*, 1893, 46e liv., p. 491.

THE VALERIANATE OF AMYL.

DR. BLANC recalls the fact that from time immemorial cider has been believed to have a beneficial effect upon gravel. The amyl-valerianic ether which is made by distillation, and is found mixed with alcohol in cider-brandy, is a mixture of the valerianate and butyrate of amyl. The former possesses a marked solvent action upon cholesterin. It is a colorless, mobile liquid of ethereal odor, disagreeable when inhaled in quantity, very sweet, and identical in odor with that of the russet apple. Its general physiological action recalls that of ether: it produces a lively general excitement and a slight intoxication, with acceleration of the pulse, warmth of the skin, sweating, general agitation, and then a tendency to sleep. If absorbed by the respiratory tract, it produces anæsthesia like ether. Its principal use is

in hepatic colic, where its stimulant and at the same time its anæsthetic properties, to which may be added its power to dissolve cholesterin, make it very valuable. It is less prompt than perhaps the ether in Durand's mixture, but it appears to be more lasting and more certain as a preventive. It can be agreeably used in capsules. In cases of dyspepsia, by no means uncommon in connection with hepatic disease, it may produce vomiting; in this case ether may be used at the start, or an injection of morphine may be administered. Later the valerianate of amyl may be given in two and one-half grain capsules every quarter- or half-hour until the crisis is past. The drug does not act by exciting the secretion of bile, but by terminating the painful spasm of the duct by the anæsthesia which it then produces to a greater or less degree, and by entering into the circulation prevents the concretion of cholesterin in crystals. In nephritic colics it acts only as an antispasmodic and general stimulant without affecting the calculus itself, although it benefits the accompanying cystitis. In nervous troubles, gastralgic crises, colics of reflex origin (cold), intercostal neuralgias, muscular rheumatism, have been benefited. Menstrual colics are relieved and even the flow increased; and in this respect it is superior to apiol, especially as being less excitant. The dyspnœa, even of angina pectoris, diminishes under its use. In hysteria it calms the convulsive manifestations, the hyperæsthesias and the neuralgias; it benefits the contractures. In alcoholic delirium it appears to have been used with success, acting better than morphine. It is very feebly poisonous; five or six capsules per day of the above-mentioned dose can be safely taken. To avoid gastric symptoms it is well to previously purge the patient, and if the treatment is to be of considerable duration a milk diet may be prescribed.—*Revue de Thérapeutique Médico-chirurgicale*, 1893, No. 23, p. 630.

THE TREATMENT OF BRIGHT'S DISEASE.

DR. W. H. WALLING presents what he terms a new departure. The diet was exclusively a meat one. Lean beef was finely chopped in a suitable machine, after having all the fibrinous and fatty portions removed. It was then broiled quickly, served hot, being salted to taste. A little butter was allowed; toasted brown bread, tea or coffee with a little milk but no sugar, constituted the balance of the diet. One hour before each meal and at bedtime, one or two cupfuls of hot water, acidulated with lemon-juice, were given. Peaches were added as they came into the market. In the reported case the appetite improved, strength began to be restored; there was no more nausea and but little flatulence. Iron in the form of an albuminate, digitalin, strophanthin, were the drugs employed. A rigid adherence to the diet appears to be essential, for it was noted that the albumin increased, and the nausea, loss of appetite, flatulence, and distressing heart symptoms, with a general decline of vitality, appeared with a discontinuance of the diet.—*Notes on New Remedies*, 1893, No. 7, p. 105.

THE TREATMENT OF DIABETIC INTOXICATION.

DR. HENRI HUCHARD finds three indications to meet: 1, to prevent the formation of toxic substances; 2, to favor their elimination; 3, to neutralize

them chemically, for opposing the grave accidents as in the period of coma. The diabetic intoxication is the result of incomplete combustion of glucose, resulting in acids which are toxic for the organism and a diminished alkalinity of the blood, poisonous of itself. In diabetic coma, with immediate necessity for the introduction of alkalies into the economy, but three routes are open: 1. Intravenous saline injections of sulphate, phosphate, bicarbonate or chloride of sodium in solution; these, intended to neutralize the acids and favor the elimination, have never cured diabetic coma. 2. Subcutaneous saline injections, the hypodermoclysis of Cantani, using chloride of sodium, can dilute the toxins and favor their elimination by increasing vascular tension and urinary secretion, but as yet it has not been put to use in diabetic coma. 3. Transfusion of blood has been used by Lecorché in three cases of coma, and death without regaining of consciousness, took place. Bleeding, and that extensively, should be strongly recommended in diabetic coma. In preventing the coma the anti-diabetic medication of Mialhe, the use of the alkalies, is serviceable. The bicarbonate of soda from seventy-five grains to three times that quantity per day is the best preventive of this condition. Fatigue, mental emotions, long journeys, and violent exercise, should be avoided. Loss of fluids, as profuse sweatings, diarrhœas, injections of pilocarpine, the use of opiates, must be prevented. An exclusive meat diet "may cure the diabetes but aggravate the diabetic." Even an excessive quantity of meats and fats may precipitate a coma, as Ebstein has shown. It is also necessary to prevent abnormal fermentations in the alimentary canal. To eliminate the toxic products it is well to prescribe the purgatives, as calomel, the salines, and diuretics. Particularly in diabetic intoxication it is necessary to prevent cardiac weakness by digitalis or digitalin, or if fatty degeneration is suspected, by hypodermatic injections of caffeine. The period of diabetic coma offers but slight hope for cure; in avoiding this condition and in carrying the patient to a successful result two points are essential—to foresee and to prevent.—*Revue gén. de Clinique et de Thérapeutique*, 1893, No. 46, p. 722.

DIURETIN.

DR. E. MAIN believes that this drug owes its activity to the theobromine which it contains. The insolubility of the latter has been overcome by its forming a double salt with salicylate of soda, which is soluble in one-half of its weight in water, and is readily absorbed. In spite of much contradictory evidence, it is believed that this drug owes its diuretic properties to a direct and non-irritant action upon true renal tissue. Whether or not it has any influence upon the heart is not altogether clear. Aside from its use in œdema and as a diuretic it has two especial uses. In children it should not be administered under the age of eighteen months, as it is likely to produce a digestive disturbance and gastro-intestinal irritation. If used in scarlatinal nephritis it should not be administered until after the termination of the first stage of the disease. After operations upon the urinary tract it has been found that it prevents the onset of urinary fever, and as well shortens the time of convalescence after the operation. It does not apparently directly influence the respiration nor excite the nervous system so much as caffeine. With the exception above noted it does not produce digestive disturbances.

Beyond diuresis it is not likely to produce urinary symptoms, nor does it have a cumulative effect—nor, indeed, can a tolerance be established. The daily dose is from sixty to ninety grains, divided into fifteen-grain doses every two or three hours. Even one hundred and fifty grains have been given without danger. With children the solution can be sweetened and a small quantity of alcohol added for its preservation.—*Bulletin gén. de Thérapeutique*, 1893, 38e liv., p. 299.

OPIMUM AS A PREVENTIVE OF AGUE.

SURGEON-GENERAL SIR WILLIAM MOORE has known opium consumers alone remain free from fever when most others suffered during extraordinary malarious seasons. As servants in India he preferred opium users, as they are less liable to sickness from exposure on the march or when taken into the colder climates of the hills. One of the constituents of opium, narcotine, has been proved to be an antiperiodic. Opium (especially when smoked) in small quantities excites the circulation and produces a glow throughout the whole system. In large quantities it soothes the system and blunts nervous sensibility. Both of these actions are antagonistic to chill, which is the first stage of malarious fevers, especially of ague. After working and perspiring all day under a tropical sun the Indian is very likely to become chilled. As a consequence of his taking opium after, or sometimes before, his evening meal, instead of feeling cold and shivering, he remains warm and glowing, and so escapes chill, which, if not the real and only cause of malarious fever, is certainly the cause of many repetitions of attack.—*British Medical Journal*, 1893, No. 1718, p. 1196.

MEDICINE.

UNDER THE CHARGE OF

W. PASTEUR, M.D., LOND., F.R.C.P.,

ASSISTANT PHYSICIAN TO THE MIDDLESEX HOSPITAL; PHYSICIAN TO THE NORTHEASTERN HOSPITAL FOR CHILDREN;

AND

SOLOMON SOLIS-COHEN, A.M., M.D.,

PROFESSOR OF CLINICAL MEDICINE AND APPLIED THERAPEUTICS IN THE PHILADELPHIA POLYCLINIC; PHYSICIAN TO THE PHILADELPHIA HOSPITAL.

ISOLATED PERIPHERAL PALSY OF THE SUPRA-SCAPULAR NERVE.

BERNHARDT (*Berliner klin. Wochenschrift*, 1894, No. 2, p. 32) has reported the case of a sailor, twenty-eight years old, who had for four years suffered with pain at the right shoulder, aggravated by movement. Except for this and some difficulty in moving the right arm the well-nourished and well-developed man was in perfect health. On inspection it was found that the right scapula occupied a slightly lower position than the left, and that its

inner vertical margin was removed a little farther from the vertebral column than that of the left. The right supra-scapular fossa was less full than the left, while the right infra-scapular fossa was distinctly excavated. The rhomboids, the levator anguli scapulæ, the trapezius, and the serratus were functionally normal and responded to electric stimulation. Despite non-involvement of the right deltoid, the patient was able to elevate the right arm with ease only to a horizontal level. By a further effort, however, he could raise the arm to a vertical position. It was evident that this was brought about only by an extra strain upon the deltoid and upper portion of the trapezius, as if in an endeavor to overcome some obstacle. The success of this effort was indicated by a visible and palpable sudden movement, after the occurrence of which the arm could be brought to the vertical position. The explanation offered for this state of affairs is that, by reason of the paralysis and atrophy of the supra-spinatus, the head of the humerus was not retained within the glenoid cavity, and that in raising the arm the head of the bone came in contact with the margin of the cavity—the interference thus encountered being overcome by the extra effort of the deltoid; the further progress of the arm was permitted as soon as the head of the humerus slipped into the glenoid cavity. External rotation of the arm was also impeded. In sewing sail there was difficulty in directing the needle outward; but no difficulty in writing had been observed. The arm could be brought well backward. The infra-spinatus muscle failed to respond to all electric stimulation. It is believed that there must have been an isolated degenerative inflammation of the right supra-scapular nerve, with consequent palsy and wasting of the supra-spinatus and infra-spinatus muscles. The affection would appear to be a rare one, for Bernhardt has observed but one other case, and he has been able to find but four additional recorded cases.

THE NATURE OF MUSCULAR RHEUMATISM.

LEUBE (*Deutsche med. Wochenschrift*, 1894, No. 1, p. 1), as a result of an experience with some two hundred cases, arrives at the conclusion that muscular rheumatism is an infectious disease, perhaps dependent upon an attenuated form of the micro-organisms upon which it is believed that acute articular rheumatism depends. Pathologic evidence in support of this hypothesis is wanting, as muscular rheumatism is not a mortal disease, but the clinical facts are in its favor. The onset of muscular rheumatism varies in different cases. In some instances the pains in the muscles are preceded by a sense of fatigue, loss of appetite, headache, vertigo, and general malaise, and sometimes there is prodromal fever. As a rule, however, severe pain sets in abruptly as the first symptom. It is not notable when the affected part is at rest, but is induced by movement. The muscles successively involved are not necessarily contiguous or related in function; on the contrary, they may be remote from the seat of primary involvement. In about two-thirds of the cases observed the course of the attack was afebrile; the remainder presented febrile manifestations of varying degree and type. In one-sixth of the cases cardiac murmurs were audible when the patients came under observation. It is, however, not implied that in all of these cases a relation existed between the rheumatism and the endocardial lesion; but in more

than half the number the murmur grew fainter or disappeared entirely in the course of observation; besides, while only one-third of the whole number of cases were attended with fever, two-thirds of the cases associated with endocarditis presented febrile manifestations. In three of the cases, however, in which the signs of endocarditis were not present when the patients came under observation, such signs made their appearance in the course of the attack of muscular rheumatism. That there is some relation between articular and muscular rheumatism would appear indicated by their frequent coexistence; while the occasional occurrence of groups of cases would suggest an infectious origin.

INTRA-CRANIAL HYDATIDS.

CLARKE (*Brain*, Part lxiii. p. 424) has reported the case of a man, twenty-nine years old, who for eighteen months had been having occasional epileptiform attacks, in which consciousness was lost and the tongue was bitten. For twelve months there had been progressive loss of power upon the left side of the body. Twice within a period of six months there had been attacks of pain in the left eye, with double vision. Three weeks before coming under observation the man had been seized with violent pain in the left temple, radiating over the left side of the head to the occipital region, and which had persisted. He seemed dull and was drowsy, but could not sleep, and took no notice of what was going on about him. He could scarcely walk, and dragged the left leg. The wrinkles of the left side of the forehead were somewhat smoothed out; the right eye could be screwed up a little more tightly than the left, and on smiling the mouth was drawn to the right. The localization of sensations, both tactile and painful, was impaired upon the left side of the face, while thermic sensibility was unchanged. The tongue was protruded straight. There was some drooping of the left upper eyelid. The left pupil was larger than the right and did not react to light. There was optic neuritis of moderate intensity in both eyes. The power of localizing sensations was impaired upon the left side of the body, but sensibility was otherwise preserved. There was incontinence of urine, which was free from albumin. The left knee-jerk was exaggerated, but there was no ankle clonus. There was no evidence of disease of the thoracic or abdominal organs. In the course of a week the ptosis on the left side had become more marked, and the left external rectus was paralyzed; the optic neuritis had increased, but some power had been regained in the left arm and leg. Two weeks later the left eye was completely paralyzed and immovable and there was cycloplegia and nearly complete loss of vision; there was additionally some convulsive twitching of the left hand. After the lapse of another two weeks the right internal rectus was paralyzed and vision was lost in the nasal half of the right visual field, while even light-perception was lost in the left eye. Muscular wasting was now evident in the left arm and leg, and reactions of degeneration were present. During the month that followed a remarkable degree of improvement took place in the paralytic symptoms, although the mental condition grew steadily worse. During this time a convulsion took place, in which the muscular twitchings began in the left hand, spread to the left side of the face, and then became general. Soon after this the

man became much worse, lay in a stuporous condition, and could not masticate his food. There was now rigid spasm of the left arm and leg. Sensation was lost upon the left eyeball, and marked unilateral sweating took place upon the right side of the face, head, and trunk. The head and eyes were turned to the right, and the right pulse was distinctly larger than the left. Death took place in coma, the temperature, which had never exceeded 99° during the progress of the case, reaching 105° shortly before death. The treatment consisted in the administration of potassic iodide, with mercurial inunctions, and hypodermatic injections of morphine for the relief of pain. At the post-mortem examination a large hydatid cyst, containing several daughter-cysts, was found in the posterior part of the left cerebral hemisphere. The cavity measured three inches in the antero-posterior, and two inches in the vertical and transverse diameters. Its walls were smooth and rounded, and showed no signs of inflammatory changes. It thus occupied and replaced the greater part of the white matter of the parietal and occipital lobes. It came nearest to the surface above, under the anterior part of the superior parietal and the upper and upper mesial portions of the ascending parietal convolutions. In this situation the pia mater was firmly adherent to the cortex, the gray matter of which was reduced to a layer about one-twelfth inch thick. The cortex had undergone most extensive atrophy under that part of the ascending parietal convolution which was concerned in the movements of the arm, and here the ascending frontal convolution was also encroached upon for a short distance. The boundaries of the cyst were sharply defined and surrounded at all other parts but those named by healthy white matter, a broad layer of healthy white substance intervening between it and the cortex. A second cyst, as large as a hazel-nut, was found at the back of the left orbit, lying between the anterior clinoid process and the sella Turcica, just posterior to the sphenoidal fissure and the optic foramen. This had compressed and destroyed the left optic nerve and the motor nerves of the eyeball. All other parts of the brain were healthy. Other cysts were found in the spleen and kidneys. The upper part of the cervical region of the spinal cord was not preserved, but throughout the remainder of the cord well-marked degeneration of the left crossed pyramidal tract was found. The nerve fibres had been largely destroyed, but the sclerosis was of moderate intensity. Sections stained in carmine showed numerous spider-cells. On carefully comparing the two sides in a number of sections the motor cells of the anterior cornu were found to be less in number upon the left than upon the right; some had undergone atrophy; others appeared granular and swollen, with loss of their processes. On the left side also the cells were more deeply pigmented and there was a larger amount of pigment in cellsthus affected, the nucleus often being obscured. The vessels in the left cornu were more injected and the perivascular sheaths were distended. In some sections there appeared to be a diminution in the fine myelinated fibrils of the gray matter of the left anterior cornu. These changes were more evident in the lower cervical and upper dorsal regions than in the lumbar and sacral portions of the cord. In some sections the alterations were slight, and in most individual sections might easily be overlooked; it was only by comparing the two cornua in a very large number of sections taken from different levels that it became apparent that there was an evident

though partial change in the motor cells of the left cornu throughout the cord. When compared with the right side, sections of some of the left anterior roots showed disappearance of some nerve fibres.

PRIMARY SARCOMA OF THE STOMACH.

WESTPHALEN (*St. Petersburger medicinische Wochenschrift*, 1893, No. 45, p. 403) has reported the case of a man, twenty-eight years old, who for about a year had complained of intense epigastric pain, independent of the taking of food, occurring sometimes shortly before eating, at other times six or seven hours after eating, and occasionally during the night. At times vomiting took place, particularly early in the morning, with the ejection of mucus and acid liquid. Meat and coarse starchy food were less well borne than other articles of diet. There was a history of previous alcoholic excess, of gonorrhœa and of syphilis. The patient had lost seventy pounds in weight in a year. The nutrition, nevertheless, appeared fairly well preserved, and the anæmia was not conspicuous. Upon palpation a sense of resistance was appreciated to the left of the median line, several fingerbreadths above the level of the umbilicus. The dulness elicited upon percussion was lost in that of the liver, but was separable from that of the spleen. The patient believed that this condition, together with digestive derangement, had been present for a year, progressing but very gradually. Investigation disclosed a condition of gastropnoia; gastric motility and absorption were somewhat delayed, tardy; the acidity of the gastric secretion was diminished, hydrochloric acid ultimately disappearing. The diagnosis remained doubtful until, on one occasion, when the gastric contents were expressed an hour after the ingestion of a glass of ice-water, a bit of tissue was found which, on microscopic examination, displayed the histologic appearances of a round-celled sarcoma. Operation was advised and undertaken, but the growth proved to be too extensive to permit of its removal. The patient lived for a month longer. Upon post-mortem examination, the walls of the stomach were found to be thickened and the muscular structure in many places almost entirely wanting and replaced by tissue of a medullary and gelatinous appearance. The mucous surface was nodulated, some of the swellings being marked by superficial ulceration. A number of small nodules were also present in the small omentum. There was, besides, bilateral pleuropneumonia, with effusion. Microscopic examination demonstrated the neoplastic formations to be of the nature of myxo-sarcoma.

THE VARIETIES OF PERIPHERAL NEURITIS.

CRAMER (*Centralblatt f. allgem. Pathologie u. patholog. Anatomie*, No. 22, 23, B. iv. p. 914), as a result of a careful analysis of the literature of the subject, concludes that a classification of peripheral neuritis, based upon the anatomic lesions, is at present impossible, nor can the clinical features be explained by the anatomic lesions. In accordance with their etiology cases of peripheral neuritis may be classified into infectious, toxic, and dyscrasic, presenting respectively distinguishing characteristics, both as to course and pathologic anatomy. Infectious neuritis is but rarely latent, but is rather

characterized by its relative rapidity of course. The lesion of the peripheral nerves presents almost all stages of medullary degeneration, simply atrophic nerve fibres and empty sheaths of Schwann being relatively uncommon, while interstitial changes are usually most common. In harmony with the acuteness of development there are found hemorrhages, distention of the bloodvessels, accumulations of leucocytes in the vessels and in the tissues, and cellular proliferation generally. Toxic neuritis is characterized by the involvement of circumscribed nerve areas, varying with the toxic agent. Latency, of course, does not seem to occur. The anatomic lesions frequently consist in a simple atrophy of the nerve fibres. Accumulations of round cells are quite uncommon, and recent hemorrhages into the interstitial tissue are almost entirely wanting. It would appear as if toxic neuritis were further characterized by segmental and periaxial involvement in the inflammation of at first individual nerve fibres, subsequently leading to a homogeneous emulsification of the corresponding medullary division. The dyscrasic form of peripheral neuritis frequently pursues an entirely latent course. Its eminent characteristic is chronicity. Simple parenchymatous atrophy is the predominant anatomic lesion. Frequently all that is found is a condition of simple atrophy, with empty sheaths of Schwann. When interstitial changes are present they usually consist in simple proliferation of the connective tissue, which not uncommonly contains vessels with thickened and obliterating walls.

SPECIFIC TREATMENT OF ENTERIC FEVER.

EUGENE FRAENKEL (*Deutsche med. Wochenschrift*, 1893, No. 41, p. 985) records a number of exceedingly interesting and valuable observations upon the employment of attenuated cultures of the typhoid bacillus of Eberth in the treatment of 57 cases of enteric fever; and RUMPF (*Ibid.*, p. 987) reports a series of 30 cases treated with attenuated cultures of the bacillus pyocyaneus. Both sets of observations were carried out at the New General Hospital at Hamburg, and the results obtained in each series of cases were strikingly parallel. Thymus bouillon was inoculated with ordinarily virulent cultures of the respective organisms and placed for three days in the thermostat at a temperature of from 96.8° to 98.6°. The bouillon was then sterilized by being placed for about twenty minutes in a water-bath at a temperature of 145.4°. Of this fluid 0.5 c.cm. were injected into the gluteal region as the initial dose as soon as the diagnosis was made, only the graver cases, however, being subjected to the treatment. The first injection was, as a rule, followed by no appreciable change in the condition of the patient. On the following day the dose was doubled—i. e., 1 c.cm. of the fluid was injected into the opposite gluteal region. Soon afterward, in most cases, some elevation of temperature was noticeable, at times accompanied with chilliness or a chill. On the third day a distinct decline of temperature was observed, and on the following a still further decline; the temperature now not uncommonly being lower than it was at the outset. If further treatment was abstained from, the temperature began again to rise, and this thus became the indication for the next injection of an increased dose. Two centimetres of the bouillon were now injected, the temperature behaving

much as it did before, with, however, a net reduction on the whole. The result was that a fever of continuous type was converted into one of remittent type, and in a short time there was complete apyrexia. The rapidity with which this result was attained varied somewhat with the individual case. Much depended upon the stage of the disease in which the patient came under observation; the earlier the better. This rule is, however, not free from exceptions: a beneficial influence was sometimes observed in cases in which the treatment was not instituted before the last stage of the disease. Together with the remissions in the pyrexia a corresponding improvement in the general condition was to be observed, the decline of temperature being attended with a copious, agreeable sweat, while at the same time there was an increased elimination of urine. The diarrhoea also appeared to be favorably influenced, and, on the whole, the patients, as a rule, presented the picture of convalescence at a time when the roseola was yet present and the enlarged spleen was still palpable. Meanwhile the patient could be better nourished, so that when the time came for him to leave his bed, some fourteen or sixteen days after the occurrence of deferescence, he was in far better condition than is the case under ordinary circumstances. Complications, even of a fatal character, were not to be absolutely averted, though the treatment was not without avail in this direction. Neither was the treatment capable of invariably preventing relapses. These, however, responded to the treatment in the same way as the primary attacks. While the hope is not encouraged that this method of treatment will prove successful in every case, it is claimed that it is more capable of favorably modifying the course of the individual attack and of shortening its duration than any other method of treatment yet employed. The injections themselves gave rise to no complications. Fraenkel fails to give in figures the results of his treatment, but among the 30 cases treated by Rumpf there were but two deaths—one from intestinal hemorrhage, the other from pneumonia. In the cases treated with dead pyocyaneus bacilli, both the elevation that followed immediately upon the injection and the subsequent decline were slightly less than in the cases treated with dead typhoid bacilli.

A CASE OF GLIOMATOSIS ATTENDED WITH AN ARTHROPATHY.

SONNENBURG (*Berliner klin. med. Wochenschrift*, 1893, No. 48, p. 1161) has reported the case of a somewhat demented man, fifty years old, who came under observation on account of some slight affection of the leg, and was found to present changes of a trophic nature at the left shoulder-joint, in conjunction with the symptoms of gliomatosis of the spinal cord. No history of traumatism could be elicited, but the man was left-handed and had been an organ-grinder, and it was thought that this association might possibly have been the exciting cause of the articular condition. On account of the mental condition of the patient the particulars of the previous history could not be reliably ascertained. On investigation it was found that the temperature sense and the pain sense were impaired in the left upper extremity and the adjacent portion of the neck and thorax, while the pressure sense and common sensibility seemed not to have suffered. The tendon reflexes and the cutaneous reflexes were not altered. The patient complained only

of dull pain referred to the left shoulder-joint. Upon inspection the left shoulder was seen to be flattened and upon a somewhat lower level than the right. The muscles of the left upper extremity, particularly of the upper arm, were decidedly atrophied; those of the scapular muscles were affected similarly, but in slighter degree. The glenoid cavity of the scapula was palpable and appeared flat and empty; the acromial process was shorter and lower than usual. The upper extremity of the humerus could be felt distinctly below the empty glenoid fossa; it was freely movable and not larger, but perhaps a little smaller, than the adjacent shaft. Nothing corresponding to the head of the humerus was appreciable. The extremity of the bone was, however, distinctly rounded. This loss of the head of the humerus readily permitted the occurrence of luxation beneath the coracoid process and into the axilla. Active movement in the joint was greatly restricted, while passive movement was not interfered with. All movement was free from pain. There were no osteoplastic deposits, neither in the glenoid cavity, nor in the capsule of the joint, nor in the tendons or muscular attachments. The elbow-joint and the wrist-joint appeared to be normal, but the capsules of the joints of the fingers were too large and permitted of undue movement.

THE PRESENCE OF EOSINOPHILE CELLS IN THE BLOOD.

ZAPPERT (*Zeitschrift für klinische Medicin*, Band xxiii., Hefte 3 u. 4, p. 226), as the result of a large number of observations, has found that in otherwise healthy persons the number of eosinophile cells present in the blood fluctuates between 50 and 250 in the cubic millimetre. The upper limit is not infrequently exceeded and an increase to 700 or more is not an exceptional observation. In children a large number of eosinophile cells is the rule. Sex, the existence of gravidity, and the occurrence of menstruation were not found to have any influence upon the number of eosinophile cells. In leukaemia the absolute, but not the relative, number of eosinophile cells is increased; the percentage fluctuates between 2 and 6. Cases of chlorosis and profound anæmia are divisible into two groups: one with the normal or an increased number, and one with a diminished number of eosinophile cells. This division, however, has no bearing upon the prognosis. In cases of cardiac disease no increase was found. Afebrile pulmonary tuberculosis is frequently attended with a diminution. In cases of bronchial asthma and pulmonary emphysema an increase takes place. Affections of the liver, excluding neoplasms, are also frequently attended with an increase in the number. In cases of nephritis there is an increase independently of the occurrence of uræmic symptoms. In the so-called functional neuroses the number is frequently increased, while in organic disease of the nervous system and in the psychoses the number, as a rule, remains normal. A large number of diseases of the skin are characterized by increase in the number of eosinophile cells, varying with the character and intensity of the disease—the extent of distribution, however, being of but secondary importance. It may be that the progressive cachexia attendant upon the presence of malignant neoplasms may cause a diminution in the number of eosinophile cells. A considerable diminution takes place immediately before death. In case of

high fever the number is frequently diminished; after defervescence, however, it is not uncommon for an increase to take place. This increase sometimes takes place during the febrile period.

THE NATURE AND MANIFESTATIONS OF FEVER.

HILLER (*Zeitschrift für klin. Medicin*, Bd. xxiii., Heft 5, 6, p. 399), from a study of the nature and the manifestations of the febrile process, arrives at the conclusion that fever consists essentially in an increase of heat-production as a result of some morbid process, and that the symptoms of the condition arise from the altered relation between heat-production and heat-dissipation; the bodily temperature rising when production exceeds dissipation (*febris ascendens*), remaining at the same level when production and dissipation are equal (*febris continua*, the normal temperature in health), and falling when dissipation exceeds production (*febris descendens*). The degree of heat-dissipation, which occurs principally through the skin, is determined by the thermic sensibility of the cutaneous nerve-endings beneath the epidermis. Both thermic sensibility and heat-dissipation vary in different parts of the body. The amount of heat-dissipation is greater in parts not covered by hair or clothing and directly exposed to the air, and the thermic sensibility of the cutaneous nerves is by habituation considerably less. The subjective sense of heat or of cold is determined by the thermic sensibility of the covered parts of the body, partly by reason of the large extent of surface and partly by reason of the greater sensibility of the cutaneous nerves of these parts. The cutaneous nerve-endings of the covered parts of the skin are from birth accustomed to a certain degree of rapidity of heat-dissipation as a result of which there is a fairly constant difference between the temperature of the body (98.6°) and that of the clothing (96.8°). This rapidity of heat-dissipation fluctuates within narrow limits, bears an intimate relation to the maintenance of the thermometric equilibrium, and gives rise to the feeling of thermic comfort in the skin. Every variation in the rapidity of this dissipation acts as an irritant (thermic irritation, comparable to electric stimulation). Increased heat-dissipation gives rise to a feeling of chilliness, diminished dissipation to a feeling of heat. The action of either stimulus is antagonistic to that of its cause—in the one instance checking the increase, in the other augmenting it. In consequence of deficient functional exercise of the unstriated muscular fibres this action is a slower one in the covered parts of the skin, and in consequence of the smaller number of bloodvessels present the action is less pronounced. In fever of ascending type the ascent of the cutaneous temperature resulting from the elevation of the internal temperature occurs earlier than the elevation of the temperature of the clothing, as the dry epidermis is a poor conductor of heat, which it gives off almost solely by radiation; the resulting increased rapidity of heat-dissipation gives rise to a chill. The more rapidly the internal temperature, and also the cutaneous temperature, rises, the more severe and more protracted is the rigor. In the same way in fever of descending type, at times, in the crisis, the lowering of the internal temperature, and with it that of the skin, in consequence of the cessation of febrile production of heat, takes place more rapidly than that of the body-covering; the resulting progressive retardation of heat-dissipation

is attended with a feeling of heat and perspiration. After the febrile production of heat has reached its maximum a period is reached in which the difference between the temperature of the skin and that of the body-covering equals that which is present in health. The skin again feels comfortable. Any change in the existing degree of rapidity of heat-dissipation acts as an irritant. Probably the intensity of the irritation and the sensibility of the cutaneous nerves is greater as a result of the elevation of temperature. However this may be, the result is that heat-dissipation and heat-production become equal. The bodily temperature remains at the same level (*febris continua*). There is thus again established a condition of the thermometric equilibrium, as in health, with the difference, however, that heat-production and heat-dissipation are both greater. This condition of equilibrium is maintained as long as the heat-production (which depends upon the febrile disease-process) and the conditions for heat-dissipation (including the bed and the surrounding temperature) remain unchanged.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE
UNIVERSITY AND GERMAN HOSPITALS;

ASSISTED BY

ALFRED C. WOOD, M.D.,

AND

C. L. LEONARD, M.D.,

INSTRUCTOR IN CLINICAL SURGERY, UNIVERSITY
OF PENNSYLVANIA; ASSISTANT SURGEON,
UNIVERSITY HOSPITAL.

ASSISTANT INSTRUCTOR IN CLINICAL SUR-
GERY IN THE UNIVERSITY OF
PENNSYLVANIA.

THE SECONDARY UNION OF PORTIONS OF SKIN REMOVED FROM THE BODY WITH THE ADJACENT FAT.

HIRSCHBERG (*Archiv für klin. Chir.*, 1893, Band xlv., Heft 1) deals at great length with the historical portion of his subject, to support his theory that hyperæmia and a weakened condition of vasor tonus are the salient features in the success of transplanting unpediculated skin-grafts, containing the entire thickness of the skin, and also the underlying connective and adipose layers of tissue. He says of his method: "The secret, in my opinion, of transplantation lies in the use of portions of skin rich in vascular supply, and especially in an artificially produced hyperæmia." He reports four successful cases in which the operation performed was the following: While the defect to be filled is held under compresses by an assistant, the operator places an Esmarch bandage and tube on the uplifted arm. The bandage is removed after a few moments, the arm laid upon the operating-table, and the portion of skin to be transplanted is beaten for two or three minutes with a doubled-up small rubber drainage-tube; he then cuts out the three sides of the graft; through

these three sides he passes sutures, leaving each with its needle *in situ*. Not until the bleeding is entirely controlled does he remove the Esmarch tube. In a few minutes the flap reddens and is markedly swollen, and the papillæ of the cuticle stand out.

After all bleeding has stopped and the wound is aseptically clean, he cuts the fourth side with scissors, lays the graft, skin side down, upon an aseptic gauze compress soaked in warm normal salt solution, and rearranges his sutures. Then the skin is quickly placed in the prepared wound and sewn in place; sometimes fine approximation sutures are required. Any oozing under the graft is then gently stroked out at the free, or fourth side, which is then sutured in place. The dressing consists of protective gauze, compress cotton, and a light compressing bandage. The healing took about six weeks; there was slight necrosis and considerable exfoliation of the epidermis during the healing process.

SKIN-TRANSPLANTING WITHOUT A PEDICLE.

THE successful restoration of the skin, after traumatic injury or operative removal, to its normal condition is a subject of wide interest. The work done in this direction by KRAUSE (*Arch. für klin. Chir.*, Band xlv., Heft 1) is noteworthy. He has within the past two years transplanted over one hundred grafts in twenty-one different cases; of these only four grafts entirely died. It does not matter how large the pieces are. Spindle-shaped strips eight to ten inches long and two and a quarter to three inches wide at their widest parts heal as easily as smaller ones. The main points in the production of good results are perfect asepsis, dry wounds, and a dry graft. The author's method of operation is as follows: The field of operation—either a fresh wound as after the removal of a tumor, or converted into a fresh wound by curetting—must be made antiseptic, preferably with sublimate solution; the antiseptic must then be completely washed away by a sterilized salt solution, and the wound dried with sterilized gauze. From this point the wound, the instruments, and the hands of the operator must be aseptic and dry. If the wound is an old one in which scar and other fibrous tissue has developed, all such tissue must be removed and only normal tissue remain. The same holds good for operations over the tibia; if there is thickening, it must be chiselled away. The field of operation is then covered by a compress and tight-fitting aseptic gauze bandage.

The skin that is to be transplanted is now thoroughly cleansed and made aseptic. Too much rubbing should be avoided; the sublimate should be entirely washed away with the sterilized salt solution, and the skin made perfectly dry. In this case, as in the other portion of the operation, the operator's hands and instruments must be dry, and asepsis, not antisepsis, used. The anterior and inner surfaces of the arms and thighs are to be used, as also that from the glutei. The strips taken should generally be spindle-shaped, as such wounds are more easily closed, and should be afterward trimmed as required. The section is cut out and then dissected up, the knife being held perpendicular to the flap. The layer of connective tissue between the skin and subcutaneous fat should be dissected up with it, but it makes no difference if small particles of fatty tissue come with it.

This graft or skin-flap is then dried by aseptic gauze compresses, with perhaps the arrest of the slight hemorrhage by torsion. It is immediately placed upon the already prepared wound, after the necessary trimming to make it fit, and is held in place by an aseptic gauze compress until it is fixed in place by a thin film of coagulated blood. Stitches are not needed, except, perhaps, in the face, and only act as foreign bodies.

The dressing consists of five per cent. sterilized iodoform gauze placed smoothly over the wound and fixed in place by the gentle pressure of an aseptic dressing, and if the case is on a limb, a splint. The first change of dressing is on the third or fourth day, when blisters will be found upon the transplanted graft, which must be carefully cut away. In order that there may be no injury to the graft, only the first bandage should be removed, and the limb then placed in a boric acid bath. In facial operations the iodoform gauze must be thickly spread with borated vaselin, and in all cases great care must be exercised in changing the dressings. The appearance, at the end of four days, is white, or, if soaked with blood, purplish and livid; at the end of seven or eight days there is a rose tint, which becomes more marked at the end of two weeks, especially when the exfoliated epidermis has been cleared away. There are sometimes slight superficial necroses that quickly heal over. The transplanted skin heals over any underlying normal tissue equally well. Complete healing occurs in from three to six weeks, depending on the underlying tissue and the age and condition of the patient. As the entire skin is used, eyebrow defects can be supplied by transplanted scalp. The skin is movable after healing has taken place, while microscopical examination twenty-two days after operation showed normal adipose tissue.

ANÆSTHESIA STATISTICS.

GURLT (*Arch. für klin. Chir.*, Band. xlv., Heft 1, 1893) gives an interesting analysis of the statistics collected during the past three years regarding surgical anæsthesia. There were 50,062 observations made by sixty observers; there were 11 deaths, or 1 in every 4551 cases. This is the average for all anæsthetics except nitrous oxide as used in dentistry. There were 133,729 cases of chloroform narcosis, with 46 deaths, or 1 death in 2907 cases. There were 14,646 cases of ether narcosis, with 1 death. There was 1 death in 4118 cases of mixed chloroform and ether narcosis. There were 3440 cases of narcosis with the A. C. E. mixture, without a death. The proportion with the ethyl-bromide was 1 death in 4555 cases. Pental had the greatest mortality, 3 deaths occurring in 597 cases. The one case of death from ether reported was in a patient weak by an accident requiring amputation of both forearms, but the shock, collapsed, and alcoholic condition of the patient made recovery in any case improbable, and the patient died three hours after operation, so it can scarcely be called a death from ether. The general conclusion to be drawn from his *résumé* of these cases is that ether is showing itself to be the better anæsthetic, and is so considered by the surgeons of Germany. The absence of a death in 14,646 cases, and its adoption and further recommendation by many more eminent surgeons each year, show its rapid progress] and the place it is earning for itself. As this author says

of the reports made by its friends: "All these quotations, which are not insignificant in number, leave no doubt that we possess in ether the most harmless and most efficient anæsthetic for all purposes, and that it is our duty, wherever human life is concerned, to return, when our better judgment tells us, to that anæsthetic with which the era of surgical anæsthesia opened, and to abandon those that have so oft endangered life."

ENTÉROPLEXIE.

RAMAUGÉ, of Buenos Ayres, under this heading publishes in an interesting monograph (Buenos-Aires, Jacobo Peuser, 1893) the results of his experiments with an "enteroplexe" of his own invention. The instrument is made of aluminium; in form, it is made of two rings having rounded edges. At either extremity of one of the diameters are two slight elevations; in one ring (the female) there is a depression into which catches on the other (the male) are inserted. These catches fix the rings together in absolute position and leave sufficient space between for the soft tissues. The diameter of the rings is variable, and should be that of the calibre of the intestine, but this is not absolutely necessary. The application of the instrument is described at the following stages: 1. The introduction of the rings into the ends of the sectioned bowel. 2. The intestine is folded in over the rings, and held in place by four sutures which have been previously passed, two through each ring. 3. The fitting together of the two rings, the catches on the male ring fitting into the cavities in the female. The space between the two rings being equal to the thickness of the intestinal wall, and the two walls being compressed between them, there must be, and is, considerable pressure; this is sufficient to preclude all hemorrhage and the escape of intestinal gases and fluids, and will, by the time adhesions are sufficiently strong, produce necrosis and the sloughing of the included portions of the gut; this will release the rings and they will then pass easily out through the intestine. The author draws the following conclusions from his work: 1. Enterorrhaphy is a tedious and difficult operation, with an enormous mortality. 2. Enteroplexy requires but little time; it can be done by any physician, and produces a perfect cicatrization. 3. The cicatrix is small, linear, and does not cause a lessening of the intestinal calibre. 4. The "enteroplexe," on account of its weight, its form, and its volume, does not endanger the intestine, and is easily passed. 5. The indications for this operation are numerous, and this instrument is applicable to them all. 6. The experiments on animals give remarkable results. 7. This operation is the desideratum of gastro-intestinal surgery.

A SUCCESSFULLY OPERATED ABSCESS OF THE SPLEEN.

SENDER (*Deutsche Zeitschr. für Chir.*, 1893, Bd. xxxvi., Heft 516) reports a case of abscess of the spleen, in a child four years old, which was cured by operation and drainage, the patient leaving the hospital thirteen days after operation. The abscess was of slow formation, and was situated in the lower portion of the spleen. At the time of the operation this organ was closely adherent to the abdominal wall, the pus had passed through the capsule and would soon have found its way out. The etiology of the case was not so

plain; there was no predisposing cause to be found, and the only exciting cause known was a slight fall which did not put the patient to bed. The symptoms were very indistinct, and there were scarcely any that made a certain diagnosis possible. Those symptoms which have generally been said to accompany this condition were for the most part absent; the only one present was that of the slight peritonitis which caused the adhesion to the abdominal parietes. The only therapeutic measure that could be applied was operation and the free evacuation of the abscess.

A CONTRIBUTION TO THE TREATMENT OF ECTOPIA VESICÆ.

BERG (*Nordiskt med. Arkiv*, Band iii., Häft 3, p. 93) details a new method for the repair of this defect, and reports in detail nine cases which he has operated on since 1886. He has modified the autoplasmic method by forming from one or other of the inguinal regions, at a preliminary operation, a flap sufficiently large to cover the opening and form the anterior wall of the bladder. Taken from this region the flap has the advantage of having less hair than from any other. The cut surfaces he covered with epidermis according to Thiersch's method, and by a second operation formed the anterior vesical wall of this double-surfaced skin flap. The results were favorable, with no tendency to lithiasis. His conclusions may be briefly stated as follows: 1. All cases of ectopia vesicæ are not amenable to the same treatment. 2. The desired result is to procure for the patient a natural receptacle for the urine as approximately near the normal as possible. 3. The most benign method, wherever it is possible, is to unite the edges of the vesical walls in the median line without any preliminary operation. Slight abnormality, with a capacious bladder and healthy mucous membrane, are indications for this method. 4. When the diastasis is greater, this method is not possible. It is not in these cases possible unless an operation be first performed on the pelvic arch. The experience is yet wanting in this method to make it one indicated, but it surely should only be done in the first two or three years of life. Trendelenburg's synchondrosiotomy, as well as the author's operation of iliac osteotomy, have given positively pleasing results. The author feels that his operation gives more solidity to the pelvis; he, however, reserves this operation for healthy, vigorous individuals, as it certainly augments the danger of operation. 5. There are a number of cases in which the plastic operation is indicated. These indications are—great thickening of the vesical parietes or a papulous degeneration that renders firm suture impossible, or where it would reduce the size of the bladder too much. Also in cases where the age or condition of the patient make the more formal operation impossible, or where that operation has failed. Autoplasmic operation, with this author's modification, seems in most cases to be the one he would prefer.

THE REUNION AFTER TENOTOMIES.

AFTER experimenting on the 112 tendines Achillis of 56 guinea-pigs, operating upon them by Vierung's open method, and making microscopical examinations at periods varying from one to ninety days, ENDERLEN (*Arch. f. Chir.*, 1893, Band xlvii., Heft 3) comes to the following conclusions:

1. The restitution of an incised tendon, as has already been proved, is

participated in by the tendon cells and the peritendineum externum and internum.

2. The injured tendon participates actively in the restitution. The tendon cells increase rapidly; closely following on this process is the formation of tendinous fibrillæ, which spring from the cut surfaces of the tendons toward each other; the two cut surfaces are also drawn together by the fibrillary cells.

3. The final healing of the tendon wound, by which he would understand the joining together of the severed parts by tendinous fibrillæ, occurs on the ninth day. The other changes in the young tendon are simply aging.

4. After severance of a tendon the sectioned portion is not the only part involved in the regeneration, but also the neighboring portions which are expanded. There appear new cell elements mixed in with the old and supplanting it. This process occurs on both cut surfaces, and involves the tendon to some depth, the new elements preponderating near the cut surfaces.

5. The tissue that unites the tendon ends is not distinguishable from tendon tissue—the richness in nuclei only indicating the growing stage.

6. The thickening of the tendons at the seat of injury results from the close packing of the fibrillæ, which is due to the contraction of the fibres after the section of tendon.

THE HEALING OF LARGE TISSUE AND SKIN DEFECTS ON THE EXTREMITIES BY MEANS OF PEDICULATED SKIN-FLAPS FROM DISTANT PORTIONS OF THE BODY.

VON BRAMANN (*Arch. f. Chir.*, 1893, Band xlvii., Heft 3), while believing that the Thiersch method of skin-grafting is very useful for the supplying of a certain class of skin defects, maintains that there are many cases in which it is not applicable. He refers especially to defects upon the extremities arising from accidents, and reports five cases, in two of which, where otherwise an amputation was indicated, he succeeded not only in preserving the limb, but also its functional power. The cases to which he would apply this method of treatment, in preference to the Thiersch transplantation, are those in which, through extensive injury, there exists a wide denudation of joints, or where tendons are exposed or have been sewn after rupture or section. In these cases the only means for preserving the joint or tendons and the functional activity of the limb is by the transplantation of a flap containing the fatty subtegumentary layer, which, on account of the usual destruction of the skin on the member, must be taken from other portions of the body.

For the closure of the wounds produced by the removal of the flaps he would recommend the use of sutures passing through the skin edge and the muscle and fascia of the wound, and tending to decrease the size of the wound; this should not be carried to such an extent as to endanger the success of the Thiersch method in closing the remainder of the defect.

In two of the cases reported there appeared three months after operation a spot of local anæsthesia about the size of a silver dollar. After an exposure to severe cold some time later, these spots were frostbitten, but healed

rapidly. At the time of reporting, both transplanted areas have normal sensibility, with correct localization.

THE RESULTS OF OCCLUSION OF THE URETERS.

SOME interesting experiments are reported on this subject by ROBINSON (*Annals of Surgery*, October, 1893), which lead him to the following conclusions: 1. Complete occlusion of the ureter produces atrophy of the kidney. 2. Partial occlusion produces hydronephrosis; the kidney cavity dilates and its wall thins. 3. The kidney will bear occlusion for some weeks and then resume its function after removal of the obstruction. 4. Urine is secreted until the urine pressure in the ureter is greater than the blood pressure; the high pressure prevents circulation in the glomeruli. 5. The ligature is apt to cut through the ureter wall and produce urinary fistula. 6. The ligature is apt to yield and the urine trickles through, producing hydronephrosis; two ligatures should be thrown about the ureters at some distance from each other. 7. It is probable that three ureters are tied in each one hundred cases of hysterectomy, while many are tied and the fact is not known. 8. Severed ureters should not be made to empty into the small intestine, as the active peristalsis prevents healing. 9. The assertion that the irritation of the ligature will produce suppression of the secretion in the other kidney was disproved. 10. Man has double the amount of kidney required for ordinary use, but when an emergency arises he needs both kidneys.

INFLAMMATORY NEW FORMATIONS DUE TO THE PRESENCE OF A FOREIGN BODY IN THE TISSUES.

THIÉRY, in summing up his remarks before the Société Anatomique (*Bull. de la Soc. Anat. de Paris*, 1893, No. 18) says: Foreign bodies when introduced into the body produce different results according to their septic or aseptic condition. Aseptic bodies are generally tolerated without noticeable reaction of the cellular tissues, save certain irritable liquids or bodies that produce sclerosis. Septic bodies can produce an acute inflammation, which terminates by abscess formation or fistulæ if the foreign body remains behind. It may, however, remain *in situ*, irritating the connective tissue and producing a simple induration or connective-tissue neoplasm.

EIGHT CASES OF HYDATID CYSTS OF THE ABDOMEN.

LLOBET (*Revue de Chirurgie*, October 10, 1893), after reporting eight cases of hydatid cysts of the abdomen, with one death, remarks that the choice of procedure in the treatment of hydatids of the abdomen, and especially of the liver, is the immediate incision or method of Lindemann-Landeau. In reality, the only other methods to be mentioned with it are that of puncture and double incision, or that of two stages. Both of these present inconveniences or dangers. The first is inefficient in cases of multilocular cysts, and dangerous when the cysts are situated deeply. It does not allow of the detection of other cysts in other neighboring organs, and in such cases is merely a palliative method of treatment, and the injections of antiseptic fluid may give rise to poisoning. The second, or method of

Volkman, offers great security, but, on the other hand, does not allow exploration. The death reported occurred in a case of relapse treated by puncture, and the author thinks his results show that the method of immediate incision and drainage is not so dangerous as has been stated.

A CASE OF ATROPHY DUE TO TRAUMATISM IN INFANCY.

CH. FÉRÉ (*Rev. de Chir.*, October 10, 1893) reports a case of a man, forty-five years old, who presented himself at the hospital for treatment for epilepsy. He presented also an interesting deformity of the left hand. The personal history showed that at the age of four months he had received a severe burn, superficial and limited to the back of the hand and fingers, but not including the thumb. It was to be expected that this uninjured portion would increase in strength and make up for the loss sustained by the member. This was not, however, the case, as the atrophy present included the thumb with the rest of the hand. The author would draw from this the conclusion that atrophy of the whole extremity may be expected after severe traumas received in infancy. The pathology of the disease is in doubt, as other influences, such as fixation, may have entered into the production of the result. The epilepsy was found to be alcoholic in origin.

THE OSSEOUS ORIGIN OF CERTAIN TUBERCULAR ULCERATIONS.

ADENOT (*Rev. de Chir.*, October, 1893), after reporting three cases of tuberculous ulceration, having for their point of origin the neighboring osseous structure, says, in his *résumé*: Certain lupoidal tegumentary ulcers, having a wrinkled or papillomatous aspect, can easily be confounded with certain malignant tumors of cutaneous origin, in particular those situated upon the hands and feet, in close proximity to the adjacent bone. Their origin is from the bone disease, though the continuity may be broken or may persist.

In the former case, though the osseous disease has healed spontaneously, it nevertheless existed. Oftentimes the bone disease will break out afresh after the cutaneous disease has apparently yielded to treatment. These relapses are certain, and their cause, often not understood, but persistent and tenacious, can only be prevented when the bone lesion has been removed.

The search for and finding of an osseous lesion is often useful in the differential diagnosis of these ulcers from malignant growths.

TWO CASES OF CONGENITAL UMBILICAL HERNIA.

BERGER (*Rev. de Chir.*, October 10, 1893), reports two interesting cases of successful operation for the radical cure of congenital umbilical hernia. The first was a case of embryonal omphalocele in which the hernial contents, the cæcum and colon, were adherent to the envelopes of the cord. The operation was done thirty hours after birth, and the patient recovered. The second case was of a similar character, irreducible, and was not seen till three days after birth; there were adhesions of the cæcum. The operation for radical cure, done more than seventy-two hours after the birth of the child, was successful.

In cases in which the omphalocele extends into the cord and is due to defective development, dating from the embryonal period, of the abdominal parietes, this author advises immediate operation, the method to be used being a laparotomy, in the course of which the hernia is reduced, adhesions of the contents are broken up, the hernial sac in all its layers is removed, and the abdominal wall united by layers of sutures passing through entirely normal and fully developed tissues. Chloroform anæsthesia the author believes to be a necessity, and as harmless as in adult life.

The case should be operated upon as soon as proper assistance and antiseptic and other precautions can be obtained. These should be as complete and careful as in any laparotomy. The only contra-indications to this immediate operation are an arrest of development so great that the abdominal wall cannot be brought together by a plastic operation, and the case of children born too long before term or too feeble. The coexistence of other malformations that do not endanger the life of the child is not a contra-indication, but may taken into account with other considerations. The same is true of other conditions, as imperforate anus, which may be cured by operation, the result of such operation being first ascertained.

A NEW METHOD IN GASTROSTOMY.

PÉNIÈRES (*Arch. Prov. de Chir.*, 1893, tome ii., No. 5), in a series of experiments, deduced the fact that if the wall of the stomach is sewn by stitches, including all the coats except the mucous, into the abdominal wound, there will follow a contracture of the tissues, and a fold of mucous membrane will be formed corresponding to the external wound on the inner surface of the stomach. This he utilizes as a valve, making his opening after it has been formed, and between its folds he inserts a drainage- or feeding-tube which is left in position for some days, and through it the patient is fed. After a time it can be removed, when the mucous folds will act as a valve and prevent the outflow of food. He found the operation successful in the case of a man suffering from impermeable stricture of the œsophagus; the patient lived thirty-two days after the operation.

THE ETIOLOGY OF CARPAL GANGLIA.

LEDDERHOSE (*Deutsche Zeitschr. für Chir.*, 1893, Band xxxvii., Hefte 1, 2) discusses this subject at length from its pathological, anatomical, and histological sides. His researches on the etiological side of the question lead him to these conclusions:

1. The ganglion takes its origin in the groove found in every normal hand, in which lies, upon the capsular ligament of the joint, a mass of fat and connective tissue that is the true source of origin of the ganglia. After attaining a certain size it seeks the surface, and reaches it generally in front of the ligamentum carpi dorsalis, between the tendons of the extensor indicis proprius and the extensor carpi radialis brevis, or sometimes the extensor pollicis longus; it can, however, reach the skin between any of the other neighboring tendons, or even through the ligamentum carpi dorsalis. The literature shows that by means of a longer or shorter pedicle extending out

over the side these growths may reach the volar side of the wrist-joint. Whether the majority of ganglia of the volar region originate thus is doubtful, but the author's material shows that they can arise directly from the volar aspect.

2. Nothing in his researches tended to prove that the ganglia have, or at any part of their existence have had, any connection with either the joint cavities or the synovial sheaths of the tendons. In no case was either direct communication or a trace of previous indirect communication found between these structures and the ganglia. Nor was there any histological likeness in their structure.

3. The typical ganglia is a new-growth, caused by a jelly-like or colloid degeneration of connective tissues, and the mingling of numerous collections into one. This takes place for the most part in the para-articular tissues, and contusion is usually the determining cause.

From the clinical aspect ganglia have a fixed course of development, come to ripening as it were, and then often heal spontaneously. Clinically he would summarize his results as follows :

1. Ganglia change their size easily ; they easily change from deep-seated to superficial growths, while secondary cysts empty themselves into older and more superficial ones, and very thin cysts are easily ruptured and then absorbed.

2. Ganglia pass away easily, leaving no trace behind, or only a small, hard swelling. In advanced life they are seldom seen. When they are ripe they are easily ruptured and absorbed.

3. The frequent relapse as seen after all methods of treatment is due to the formation of other cysts that communicate with the original and occasion re-filling. The author advises the leaving to Nature the spontaneous healing, as the best method ; but this is not possible in all cases, and in these cases, as well as those where the patient demands a speedy removal of the tumor, he advises excision, with incision of all the surrounding structures, or incision, curetting, and packing with tampons.

A SUCCESSFUL RESECTION OF THE THORAX AND LUNG.

MÜLER (*Deutsche Zeitschr. für Chir.*, 1893, Band xxxvii., Hefte 1, 2), reports an interesting case of the removal of a large malignant growth from the right thoracic wall, which had involved the lung and required a resection of the lung and suture to complete the operation. The patient recovered and is now well three years after the operation, with one slight return of the disease *in situ* two years since. The author found that the symptoms of collapse, so often described, that come on when the lung collapses were entirely removed by lifting the tumor and lung into their normal relations, and that after the tumor was removed, the lifting of the lung into normal position and holding it there prevented the recurrence of the collapse. The same effect was produced after the wound had been closed, except for drainage, by packing this opening with iodoform gauze. The author advises asepsis instead of antiseptics in operations of this character. He believes that these tumors are operable, and that the results obtained make it for the patient's interest to be operated upon.

To prevent collapse, all the ordinary means should be at hand and should be used, and the collapsed lung should be brought back and kept in contact with the thoracic wall, and the drainage procured through iodoform packing.

GASTROSTOMY BY WITZEL'S METHOD.

KEEN (*Annals of Surgery*, December, 1893) reports an interesting case of gastrostomy by this method, which he believes to be the best now known. The patient suffered from malignant stricture of the œsophagus. The operation proved entirely satisfactory, the tube was retained with no leakage, the wound healed perfectly, and the patient gained rapidly in strength, which continued. The patient was doing well three months after the operation, and there had been no leakage.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

J. SOLIS-COHEN, M.D.,
OF PHILADELPHIA.

CROUP.

THE *Brooklyn Medical Journal* for August, 1893, devotes considerable space to the subject in various bearings. DR. WILLIAM MADDEN extols treatment by exposing the patient to the fumes produced by the sublimation of calomel, which he states was first used for that purpose by Dr. Corbin, of Brooklyn, in November, 1874.

On the subject of intubation is a commendatory paper by DR. GEORGE McNAUGHTON, with an elaborate table of statistics of 2417 instances of tracheotomy with 586 recoveries, 70 of which operations (with 11 recoveries) had been performed subsequently to intubation; 5546 instances of intubation with 1691 recoveries; 505 instances of calomel sublimation, with 275 recoveries; and 85 tracheotomies or intubations (with 29 recoveries), subsequent to sublimations.

DR. LEWIS S. PILCHER discusses the comparative value of tracheotomy and intubation for the relief of acute laryngeal stenosis in children, and while arguing that tracheotomy is more effective than intubation, admits that by intubation many lives are saved which would otherwise perish from refusal of surgical operation.

It is to this latter class of cases that he very justly, as the compiler believes, would restrict the indications for the preference of intubation in the presence of conditions favorable for the proper performance of tracheotomy and due supervision afterward.

LYMPHOID GROWTHS IN THE VAULT OF THE PHARYNX.

DR. THOMAS R. FRENCH, of Brooklyn, contributes a valuable paper (*Brooklyn Medical Journal*, 1893, No. 6) on this theme. The macroscopical appearances in position, the facial expressions of the patients, the minute pathologic anatomy of the specimens removed, and the details of operation are exquisitely illustrated, largely by photographic reproduction. Dr. French wraps children in a blanket, etherizes them, binds them to a chair tilted backward, raises the chair slowly to the upright position, places a mouth distender in position, draws the palate forward, and removes the mass piece by piece with cutting forceps.

LARYNGECTOMY FOLLOWED BY VOICE WITHOUT ARTIFICIAL APPLIANCE.

LAST May, at the meeting of the American Laryngological Association (*Medical News*, Philadelphia, June 3, 1893), the editor of this department exhibited a man from whom, fourteen months previously, he had removed the larynx and the first ring of the trachea for carcinoma, and whose second, third, and fourth rings, which had been incised anteriorly in a preliminary tracheotomy, he had stitched to the integument, thus completely shutting off the trachea from the pharynx. This man had learned to speak with a well-modulated voice audible more than forty feet, and sang before the Fellows a few stanzas, in which the changes of pitch of the voice were quite as good as those of a normal voice during hoarseness. The patient distends the integument above the tracheal orifice into a sac of air which he propels against two folds at the lower portion of the pharynx, and which appear to be portions of the lower constrictor muscles. The modulation of the voice points to muscular tension in the new phonal reeds, which would hardly occur were they mere favorably located folds of adventitious tissue. At the date of writing this record, eighteen months after the operation, there has been no sign of recurrence. The man is strong and happy, breathes without a canula, and has been thus far permanently freed from pain, cough, and difficulty in swallowing. Recently, in meeting a patient treated palliatively by tracheotomy, and whose voice is hardly audible, he stated that he would not change conditions for the world, as he would not care to live with his tumor and his tube.

PROF. P. POPPERT, of Giessen, reports (*Deutsche med. Wochenschr.*, 1893, No. 35) a case in which he performed an operation similar to the one above alluded to, but different somewhat in detail. The trachea, however, was stitched to the skin and cut off from communication with the pharynx. Immediately after the operation the patient was able to make himself understood in whispers, similar to those made by patients with occluded larynges. He was also able to swallow liquid nourishment at once.

The voice improved in strength, but still retained its whispering character at the time of report, one year later. Poppert refers to the case observed by H. Schmid (*Arch. f. klin. Chir.*, Bd. xxxviii. p. 132), in which a loud so-called pseudo-voice was produced in a case in which communication between trachea and pharynx had been cut off. This case was recently exhibited to

the Medical Society of Berlin (*Medical Record*, New York, 1893, vol. xliv., No. 13), but the manner in which the voice was produced does not appear to have been solved satisfactorily.

These three cases seem to warrant the suggestion of Schmid and Poppert, that an artificial larynx is not necessary for voice after laryngectomy, while the shutting off of the pharynx from the trachea immediately after the operation secures the patient from aspiratory pneumonitis, and thus improves his chances for recovery. At any rate, they are remarkable instances of the ability of Nature to restore function by substitutive structures, after removal or disorganization of the structures proper to the function.

In a case of carcinoma in which the writer removed one vocal band after section of the larynx, voice was restored by substitutive structure, and remained good for twenty-five years, or up to the patient's death from paralysis.

Certainly, security from infection of the air-passages, ability to breathe without a canula, and the prospect of a voice far better than can be supplied with an artificial contrivance, are objects worth striving for, and therefore this method of operation should be repeated until its actual value has been determined one way or the other.

INTUBATION IN STENOSIS OF THE LARYNX.

DR. ROSENBERG has reported eleven cases (*Deutsche med. Wochenschr.*, 1893, No. 35):

1. Hysteric contracture of adductors. Improvement until subglottic reaction followed an unskilful attempt to introduce the tube, and prompt tracheotomy became necessary.

2. A similar case. Cure after five daily repetitions of intubation.

3. Syphilitic stricture previously treated with Schroetter's bougies. Failures to destroy granulation membrane by scraping, electric cauterization, and the like. Cure by intubation in a short time, so that the patient has lived without his canula for a year.

4. A similar case. Intubation early in the treatment rendered tracheotomy unnecessary.

5. Subglottic laryngitis with intense dyspnœa. Intubation restored free respiration within two days, but then the tube had to be removed on account of cyanosis produced by occlusion of its calibre.

6. Multiple papilloma of larynx. Intermittent intubation. Every time the tube was introduced small particles of papilloma were coughed out, freeing the respiration at once.

7. Multiple papilloma in a child aged six years. The dyspnœa was relieved after three intubations.

8. A tracheotomized case of tuberculous arytenoid perichondritis. After two intubations the left vocal band, heretofore fixed in the median line, became somewhat mobile.

9. A child four years of age, tracheotomized for diphtheria, who could not be freed from his canula. Cured by three days' continuous intubation.

10. A membrane between the vocal bands anteriorly; the result of a lance-wound of the larynx. Electric destructive cauterization and subsequent intubation was followed by a brilliantly favorable issue.

11. Bilateral paralysis of posterior crico-arytenoids, with acute inflammatory manifestations. Intubation with frequent coughings out of the tube and reintroductions. Tracheotomy eventually necessary.

PARALYSES OF THE LARYNX.

ONODI reported, at a meeting of the Laryngological Society of Berlin, July 17, 1893 (*Annales des Mal. de l'Oreille, etc.*, 1893, t. xix., No. 8), an interesting case of bilateral aneurism of the aorta in which the vocal band of the right side was immobilized in the cadaveric position, while that of the left side was practically in the middle line. Section showed that the right recurrent nerve was injured in its totality by the aneurism, while the left recurrent was compressed only in part by the aneurism of the left side.

Onodi had succeeded in preparing the muscles, isolated with their nerves detached, and had submitted them to microscopic examination. He had recognized a degenerescence of all the muscles and nerves on the right side, while on the left the most serious alterations had implicated the posterior crico-arytenoid muscle and its nerves; the internal thyro-arytenoid muscle having been implicated to a less degree, and the lateral and transverse to a still less extent.

CHRONIC ŒSOPHAGITIS.

DR. SAMUEL LODGE, JR., reports (*Journal of Laryngology*, 1893, vol. vii. No. 9) the case of a married lady twenty-four years of age. The main symptom was pain after swallowing solids, usually continuing for at least twenty-four hours, and felt over the front of the left chest, radiating toward the left scapular angle. Freedom from pain required abstinence from solid food. Liquid diet for a fortnight, with the administration of bismuth lozenges, produced benefit, but the patient did not think the latter did any good, and they were discontinued. Light farinaceous food with eggs and jellies was permitted, and three months later tripe, minced meat, and the like. In six months the ordinary diet could be resumed, but very hard morsels still produced some discomfort in deglutition.

LYMPHOID NODULES AT THE VAULT OF THE PHARYNX.

It is well known that the embarrassed respiration produced by hypertrophic conditions of these structures impairs physical development, and that the stunted patient often grows rapidly after removal of the morbid structures.

MR. PERCY S. JAKINS reports (*Journal of Laryngology*, 1893, vol. vii. No. 9) a remarkable instance of the kind, in which a lad five feet three and a half inches in height at seventeen years of age, increased to five feet ten inches within two years after removal of enlarged adenoids and tonsils, and increased proportionately in weight. His brothers had attained a height of six feet before they had reached his age.

OBSTETRICS.

 UNDER THE CHARGE OF

EDWARD P. DAVIS, A.M., M.D.,

PROFESSOR OF OBSTETRICS AND DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC;

CLINICAL PROFESSOR OF DISEASES OF CHILDREN IN THE WOMAN'S MEDICAL COLLEGE;

CLINICAL LECTURER ON OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE;

VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.;

ASSISTED BY

WILLIAM H. WELLS, M.D.,

ASSISTANT DEMONSTRATOR OF CLINICAL OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE,

PHILADELPHIA; CLINICAL ASSISTANT TO THE CHAIR OF OBSTETRICS AND

DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC.

 VERSION WITH ONE FOOT.

NAGEL (*Archiv für Gynäkologie*, Band xlv., Heft 1) contributes an article relative to version with one foot, and discusses which one is best to bring down first. As a result of his observations in thirty cases of his own, and from a consideration of many reported by other authorities, he concludes that in order to complete version of a child *in utero*, it is indifferent which foot is seized. If one has in view the fact that the drawn down and extended leg shall lie, immediately after complete version, forward, behind the symphysis, one will generally obtain this if the *under* leg in dorso-anterior and the *upper* one in dorso-posterior position is drawn down. If there has been produced through version an incomplete foot presentation with posterior leg extended, it will probably turn forward in such a manner that the back of the child slides by the promontory. If in such cases as the one last mentioned, it is necessary to hasten the birth of the child, such turning of the breech of the child on its long axis must be favored, as will bring the extended leg forward.

 DECIDUO-CELLULAR SARCOMA AND DECIDUAL TUMORS.

SÄNGER (*Archiv für Gynäkologie*, Band xlv., Heft 1, p. 89) takes as his text the case of a married woman aged twenty-three years, who, after an injury received in stepping from a railroad train, aborted incompletely in the eighth week of gestation. She suffered from hemorrhage continuously for three weeks, at the end of which time fever ensued, with symptoms of septi-cæmia. The uterus was curetted, after which the fever and hemorrhage ceased; but the pulse remained about 100. The woman was confined to her bed for five months, the convalescence being protracted by a diffuse parametritic exudation. A progressive enlargement of the uterus was now noticed, without tenderness and purulent discharge, and the patient was compelled to return to bed on account of fever and severe pain in the left hypochondrium. Soon there suddenly appeared in the right iliac fossa a soft, elastic, painful tumor as large as a goose-egg. This was suspected to be an abscess occurring during a chronic septic infection, and on this supposition was opened. No

pus was found, but a fungoid, spongy mass which was removed with the fingers and sharp spoon, exposing the bone beneath. Under the microscope the removed tissue consisted of cellular débris, with large nucleated round cells intermixed with small spindle-shaped cells and numerous small apoplexias. No tubercle bacilli could be found. There were no signs of pulmonary tubercular infection. The uterus was now as large as in a normal pregnancy of three or four months' duration. The patient was sent to the surgical department, but, owing to the uncertainty of the diagnosis, no operation was performed. She became rapidly dyspnoëic, and finally died from exhaustion. At time of death there was orthopnoëa.

The autopsy showed the uterus adherent on left side, and filled with spongy, dark-purple masses varying in size from a nut to an apple. Masses were classified as sarcoma telangiectodes, and most resembled mycosis fungoides of the skin. The uterine mucous membrane was not penetrated by the diseased masses. Metastatic masses were found in the iliac fossa, lungs, diaphragm, and ribs. The microscope showed in the tissues small hemorrhagic foci and large nucleated round cells closely resembling the giant decidual cells; these latter seemed the earliest and simplest elements. The decidua apparently was the starting-point, the abortion being perhaps the initial lesion.

The forms of sarcoma now recognized may all be traced back to cells of mesoblastic origin and their products. Sarcomatous degeneration of the cells of the inter-glandular tissue of the mucosa uteri, according to Virchow, is divided into globo-cellular, fuso-cellular, and myxo-sarcoma, together with a mixed formation—sarcoma carcinomatodes. To these should be added sarcoma deciduo-cellular, sarcoma of the mucosa uteri transformed into decidua. In ectopic pregnancy, as is well known, the connective-tissue cells of the mucous membrane and muscular coat of the tubes, together with the serosa peritonei, undergo this transformation. During pregnancy the tissues of the sexual organs receive an immense impulse toward new formations, and conditions obtaining in the foetal tissues may be impressed upon and transplanted to those of the mother. There may also be an infection of micro-organisms, as in many cases infectious disease of the decidua preceded the swelling. The diagnosis is based on the hemorrhage and ichorous discharge. These symptoms following a shorter or longer time after birth would make one suspect the presence of a deciduo-cellular sarcoma, especially if they return after complete evacuation of the uterus of all foetal remains. A microscopic examination of fragments taken from the uterus by the finger should be made.

Regarding treatment, the author states that this variety of sarcoma is regarded as malignant; its early and accurate diagnosis is therefore of great importance. Complete extirpation is the only treatment worth attempting.

RECURRENT TUBAL PREGNANCY IN THE SAME WOMAN.

ABEL (*Archiv für Gynäk.*, Band xliv., Heft 1, p. 55) contributes an article on the above-named subject. In regard to the causation of recurrent or single tubal pregnancy, most authors ascribe it to causes other than affections

of the tubes, and some even regard the contractions of their lumen as secondary in importance. Virchow assigns as a cause peritonitis and pseudo-membranous adhesions with constriction of the affected tube. Spiegelberg speaks of swelling of the tubal mucous membrane and obstructive collection of secretions. Klob mentions hernia of the mucous membrane and consequent arrest of peristalsis; or polyps of the uterine end may obstruct the ovum in its passage. It is also said that deficient, or absent, motion of the cilia is a cause of delay in the passage of the ovum, so that it finally grows too large for further progress. Any or all of these causes may at times be present, but they are not sufficient to account for a double recurrent tubal gestation. An abnormal formation of the tube, due to defect in embryonic development is the common source, and it affects both tubes equally. Freund's researches have shown that the tubes, after the union of the middle parts of Müller's ducts has formed the uterus, show a spiral, corkscrew-like twist, involving the whole tube. This occurs during the descent of the duct. When this has reached its greatest length, the turns begin to smooth themselves laterally from the uterus. These turns may remain as a permanent arrest of development, the surroundings being in no way involved and no trace of perisalpingitis or pelviperitonitis can be found. The condition may be often seen in the bodies of children. Thus any healthy woman is liable to a tubal pregnancy from her tubes remaining in an infantile state and the pregnancy be physiological. Again, the tubal canal does not always run in the middle of the tube cylinder; its course may be most devious, approaching and receding from the surface of the tube, which thus having walls of unequal thickness and resistance, the growing ovum distends it at the point of least resistance, and may thus be arrested in its progress. Another antecedent cause may be found in the so-called diverticulum of the tubal canal. The ovum may be entangled therein. To establish a diagnosis of single or recurrent tubal pregnancy, special importance attaches to the extension of a decidua from the uterus, though its absence is no proof that the gestation does not exist. A microscopic examination of the membrane is essential, though it is not certain that from it its extra-uterine character can be determined certainly. In various conditions membranes are thrown off from the uterus, thus: 1st. In extra-uterine pregnancy. 2d. Dysmenorrhœa membranacea. 3d. In intra-uterine pregnancy with abortion. In the first, the cellular part of the gland layer is fully differentiated, the inner layer is extended, the outer remains in the uterus. In the second, all the elements of the normal mucous membrane are cast off. On its surface is normal epithelium; the deep glands have their epithelium unaltered. All sorts of cells are found in their connecting tissues, and foci of infiltration abound. In the third, one finds either ovular débris or membranes showing the unmistakable evidences of pregnancy. The chief difference between the decidua of extra-uterine pregnancy and that of dysmenorrhœic membrane lies in the presence or absence of glands.

The treatment of this condition is laparotomy and removal of the sac. At the time the other tube should be examined, and if found to be spiral or twisted it should also be removed. Neither injection of the sac nor electro-puncture gives any positive assurance that subsequent rupture and hemorrhage may not occur.

UTERUS SUBSEPTUS.

CEPINSKY (*Centralblatt für Gynäkologie*, 1893, No. 33) reports the details of an interesting case of a double vagina in a woman twenty-six years of age. Menstruation regular. On examination the external genitals were found normal. The introitus vaginæ was not median, but by the side of the right labium majus. Hymen gone. Near the introitus was discovered a second opening 50 mm. broad, surrounded by a fringe of mucous membrane, through which a sound was passed into a second vagina, narrower than the first, but otherwise perfect. From either a sound could be introduced into the uterus, each vagina having a separate and perfect portio vaginæ uteri. Whether the division that completely separated these vaginæ extended throughout the uterine cavity could not be determined. The uterus was of normal size. Coitus easy and normal. A year later the patient returned for advice, complaining of irregular hemorrhage from the genitals accompanied by uterine pain. Had not menstruated for ten weeks. Examination showed the old anomaly with bleeding from the small opening of the left vagina. In the right vagina the os was open and there was hemorrhage therefrom. As the vaginal vault was pressed with the speculum a segment of foetal membrane was observed to pass out of the os. Corpus uteri enlarged and soft. Abortion occurred on the following day, the ovum being the size of a plum, and in it an embryo three centimetres long was found. Ten days after the abortion, for experiment, milk was injected through the left cervix into the uterine cavity and this was observed to flow out through the right os.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

THE CURATIVE EFFECT OF CÆLIOTOMY ON PERITONEAL TUBERCULOSIS.

WARNEK (*Centralblatt für Gynäkologie*, 1893, No. 50), after reviewing all the evidence in favor of the cure of tuberculous peritonitis by simple abdominal incision, with or without drainage, arrives at the conclusion that whenever the cavity is opened the peritoneum undergoes a certain amount of irritation, due to the change in its physiological condition caused by the entrance of air and the lowering of its normal temperature. In the case of various manipulations of the abdominal contents, by irrigation, sponging, the separation of adhesions, etc., an additional element of irritation is introduced, which is manifested not only by congestion of the serous surface, but by the subsequent formation of adhesions, which may in time be entirely absorbed, as shown by secondary operations. It is well known that in cases of ascites due to secondary papillary or carcinomatous growths on the peritoneum, the fluid may

quickly reaccumulate after several tapplings, but when an exploratory incision is made this may not occur, although the conditions remain unchanged. Hence the following conclusions may be drawn: After the abdomen has been opened in a case of tuberculosis and the peritoneum has been irritated by manipulation, a plastic exudate is thrown out and adhesions are formed. Provided that no conditions are present favorable to their further development, the bacilli are destroyed by this exudate and the tubercles undergo fibrous degeneration. In the course of time the exudate is absorbed and a cure of the disease results.

NEW METHOD OF TREATING PERITONEAL TUBERCULOSIS.

NOLEN (*Berliner klin. Wochenschrift*, 1893, No. 24), being convinced that the favorable results observed after cœliotomy are due to the simple contact of air with the peritoneum, has conceived the idea of introducing air into the abdominal cavity through a needle. He reports three cases, two of which were successful. In these, repeated tapplings had been employed, but the ascitic fluid always reaccumulated, until air was pumped in by means of an apparatus devised by the writer. A third successful case is reported by Mosetig-Moorhof.

TREATMENT OF STERILITY.

SEELIGMAN (*Münchener med. Wochenschrift*, 1893, No. 45) has found that in his experience the husband is in fault in 75 per cent. of the sterile marriages, through azoöspemia due to double epididymitis. That the latter condition is not necessarily hopeless was shown by the reappearance of living spermatozoa in the semen after treatment. He recommends the active treatment of gonorrhœal epididymitis as soon as possible after the inflammatory stage, with a view to prevention.

The application of galvanism to the cervical endometrium is often successful, as well as the use of the faradic current in cases where there is entire absence of sexual response on the part of the female.

THE ACTION OF SALICYLIC ACID ON THE UTERUS.

BINZ (*Berliner klin. Wochenschrift*, 1893, No. 41) states that salicylate of sodium has a beneficial effect in cases of dysmenorrhœa and scanty menstruation not due to chlorosis. In gouty subjects it is indicated in cases of menorrhagia, as well as in patients who are prone to early abortion.

VAGINO-FIXATION OF THE UTERUS.

KNORRE (*Centralblatt für Gynäkologie*, 1893, No. 51), in an extended article, reports the results of a series of twenty-four cases operated upon in Küstner's clinic according to Mackenrodt's method. Of these only nine were entirely successful. He regards the operation as indicated in all cases of retroversion with a movable uterus that cannot be kept in position by a pessary, especially when there are accompanying lacerations of the cervix and perineum; also when the patient cannot tolerate a pessary. It is contra-indicated in

prolapsus, in retroflexion with fixation, and in cases in which a cure can be expected with a pessary.

NEW OPERATION FOR STENOSIS OF THE OS UTERI.

POZZI (*Annales de Gynécologie et d'Obstétrique*, December, 1893) describes the procedure thus: He first divides the cervix on both sides with scissors, then excises a wedge from each flap on either side of the canal—four in all. The mucous membrane of the vagina is united to the mucosa of the cervical canal with silver-wire sutures in such a way as to close the four raw surfaces. The result is a condition similar to that of an ordinary bilateral laceration, but without the formation of cicatricial tissue and the disturbances to which this gives rise.

FIBROMYOMA OF THE OVARY OR BROAD LIGAMENT.

DELEGRANGE (*Archives de Tocologie et de Gynécologie*, 1893, No. 12) reports a case of fibromyoma of the ovary weighing nearly seven pounds. The tumor was adherent and the pedicle was twisted several times about its long axis. On section the growth showed hemorrhagic softening. There was some doubt as to whether it originated in the ovary or in the broad ligament. The writer gives the histories of six reported cases of pedunculated fibromyoma of the broad ligament, from which he makes the following deductions: Ascites was seldom present to any extent. In most cases the tumor grew rapidly and was accompanied by severe pain, probably due to the presence of adhesions. The differential diagnosis from ovarian fibroma, or even from pedunculated uterine fibroid is practically impossible. The surgical treatment of these neoplasms presents no special features.

PSEUDO-MEMBRANOUS ENTERITIS FROM A GYNECOLOGICAL STANDPOINT.

MONOD (*Ibid.*) concludes an article on this subject as follows: 1. Pseudo-membranous enteritis is frequently observed in connection with disease of the uterus and adnexa. 2. It affects the large intestine and gives rise to chronic constipation with colicky pains. 3. It may coexist with membranous dysmenorrhœa. 4. Sometimes it seems to be due to compression of the rectum by the retroflexed uterus. 5. In some instances it seems fair to infer that it is the result of the extension of an inflammatory process from the uterus or peri-uterine tissues. 6. The possibility of its existence should be borne in mind in all cases of intractable abdominal pain in patients with pelvic trouble. A careful study of the symptoms will show that these are often due not to disease of the uterus or adnexa, but to the intestinal tract.

TREATMENT OF INFLAMMATION OF THE ADNEXA.

JACOBS, of Brussels (*Ibid.*), reports eighty-six cases of cœliotomy for disease of the adnexa, with five deaths; and one hundred and forty cases of vaginal extirpation of the uterus, with diseased tubes and ovaries, with only two deaths. In the former series the result was only partly successful in thirty cases, while in the latter he obtained a cure in one hundred and

twenty-nine cases. The only accidents accompanying the vaginal operations were two cases of perforation of the bladder and one of the intestine, all of which healed perfectly after suturing. There was one case of permanent vaginal fistula, one of dementia, two of adhesion of the bladder, and four of obstinate gastro-intestinal trouble. The writer remarks that these statistics are "sufficiently eloquent in themselves."

His technique in the removal of unilateral disease of the adnexa is briefly as follows: The posterior vaginal fornix is incised transversely with the thermo-cautery knife. Preliminary curettage he regards as unnecessary. The peritoneum is then torn through with the finger and the exact condition is ascertained by palpation. The diseased adnexa are then enucleated, the writer believing that he can separate firm intestinal and intra-pelvic adhesions more easily than through an abdominal incision, the advantage being that it is not necessary to penetrate a layer of adherent intestines (*dôme intestinal*) before reaching the tubes and ovaries. If the uterus is retroflexed and fixed, it should first be detached. When the tube and ovary on one side occupy Douglas's pouch, their removal is easy; it is more difficult when they are adherent to the anterior surface of the retroflexed uterus. After they are freed, they are drawn down into the vaginal wound with two fingers and are seized with forceps. Clamps are then placed on either side of the mass and it is excised. The clamps are left *in situ* for forty-eight hours with a dressing of iodoform gauze. The patient is usually up on the fourth (!) day, and is ready to be discharged on the tenth or twelfth. These results present a striking contrast to the convalescence after abdominal section.

The writer is a strong advocate of extirpation of the uterus in double salpingotomy, not only because the organ is the original seat of gonorrhœal infection which still resides in the endometrium, but because it is useless to the patient after the removal of the adnexa. In the cases before mentioned in which hysterectomy was performed, in ninety-seven the adnexa were entirely removed, and in twenty-seven partially; in sixteen hysterectomy *par morcellement* was done. He has tried all the palliative methods, especially that of incising and draining pus tubes *per vaginam*, which latter he found unsatisfactory on account of the tendency to the formation of a persistent fistula. The indications for the different operations are thus summarized: In the initial stage of salpingitis secondary to ordinary septic infection, before the tubes have become encysted, elect curettage with drainage; some cases of purulent salpingitis may be cured by the same method, through drainage into the uterine cavity. Pyosalpinx is to be treated either by vaginal incision, or better by vaginal extirpation. Gonorrhœal salpingitis is to be treated by vaginal extirpation with accompanying extirpation of the uterus.

[This paper well repays careful study; not only are the statistics remarkable, but the writer's candor, enthusiasm, and clear, virile style are most attractive.—H. C. C.]

THE PROGNOSIS AND TREATMENT OF VULVO-VAGINITIS IN CHILDREN.

ROCAZ (*Ibid.*) calls attention to several direct consequences of this condition, such as ulceration of the labia, purulent conjunctivitis and otitis, and joint affections. The general health may be seriously affected. Peritonitis

may result through extension of the inflammation, several cases having been reported in infants. It is probable that the endometrium is liable to become infected in girls at puberty, from a latent vaginitis of long standing. In regard to the local treatment the writer calls attention to the fact that the ordinary applications, astringents, antiseptics, etc., relieve but do not cure the affection, since they do not reach the seat of the trouble within the vagina. Medicated crayons containing iodoform, salol, thallin, etc., are not only painful to the little patient, but may cause added irritation. He employs vaginal injections of permanganate of potassium, beginning with a solution having a strength of 1 : 4000, and increasing it up to 1 : 1000. The child is placed on her back across a bed and a rubber male catheter is introduced into the vagina, through which is injected a pint of the solution. The operation is not painful and is well borne by the patient. A slight increase in the discharge will be noted at first, but it soon begins to diminish and disappears entirely within from two to four weeks, during which time the injections are repeated thrice a week. Several successful cases are reported.

THE USE OF CHLOROFORM IN GYNECOLOGY AND OBSTETRICS.

BRENNECKE (*Münchener med. Wochenschrift*, 1893, No. 1) reaches a different conclusion from many observers with regard to the action of chloroform on the kidneys. He calls attention to the fact that where the patient has no bad symptoms after anæsthesia, albumin is invariably absent from the urine, and *vice versa*. Serious renal troubles may develop after the administration of chloroform in patients who showed no previous evidences of the same. Albumin and casts (nearly always hyaline) usually disappear from the urine within a few days, coincident with the disappearance of unfavorable general symptoms, such as nausea, loss of appetite, etc.

The writer concludes that chloroform should be administered only when it seems to be absolutely necessary, and that it is contra-indicated in cases of renal disease. With the exception of fatty degeneration, he thinks that its use is attended with less danger in organic cardiac than in renal affections. He furthermore advises that its use in midwifery be limited, and that it be excluded in the treatment of eclampsia (?).

POST-PARTUM OVARIOTOMY.

LAWRENCE (*British Med. Journal*, Sept. 16, 1893) argues in favor of ovariectomy during pregnancy, as soon as the tumor is discovered, on account of the low rate of mortality and the increased risk during parturition. He reports ten cases in which the existence of the cyst was not suspected before labor had begun. In every instance rotation of the cyst and peritonitis occurred; in one the cyst ruptured. The patients nearly all had symptoms of peritonitis following parturition, and all were operated upon successfully. If the cyst is recognized during labor the writer advises delivery with forceps as soon as possible, the accoucheur being prepared to open the abdomen as soon as serious symptoms develop. In their absence, it is better to wait a month before operating.

HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF

EDWARD F. WILLOUGHBY, M.D.,

OF LONDON;

AND

CHARLES HARRINGTON, M.D.,

INSTRUCTOR IN MATERIA MEDICA AND HYGIENE, HARVARD MEDICAL SCHOOL.

DISINFECTION OF SEWAGE WITH SULPHURIC ACID.

DR. M. IVANOFF (*Zeitschrift für Hygiene und Infektionskrankheiten*, Bd. xv., 1893), following Koch who showed that cholera bacilli are quickly killed in gastric juice, and Kitasato who showed that in bouillon they are killed after some hours by the addition of 0.132 per cent. of hydrochloric or 0.049 per cent. of sulphuric acid, and Stutzer who found that they are killed in a quarter of an hour in distilled water with the addition of 0.05 per cent. of sulphuric acid, interested himself in the problem of the disinfection of sewage by the same means. On account of the presence of substances which in sewage so treated would combine with and render inert a part of the acid, it was evident that stronger solutions than the above would be required. Sewage of different degrees of foulness was used. With Potsdam sewage, which was three times as foul as that of Berlin, and slightly alkaline in reaction, 0.08 per cent. of sulphuric acid was enough to kill cholera bacilli in fifteen minutes. As compared with other chemicals, sulphuric acid is second in point of cheapness, lime being first.

ACTION OF SOZOIODOL PREPARATIONS AND OF TRIBROMPHENOL-BISMUTH ON CHOLERA BACILLI.

DR. ARTHUR DRAER (*Centralblatt für Bakteriologie und Parasitenkunde*, 1893) finds, from purely bacteriological experiments with these agents, that the soziodol preparations, particularly the acid and the mercury compound, exert a powerful disinfectant power on cholera bacilli, the sodium, potassium, and zinc compounds in lesser degree. The tribromphenol-bismuth, even in double the amount, cannot approach the soziodol preparations in activity; it has but a very slight, if any, preventive influence on the development of cholera bacilli. These preparations are put forward as intestinal antiseptics. Tribromphenol-bismuth is a combination of almost equal parts of tribromphenol and oxide of bismuth. Hueppe attributes to it an almost specific action on cholera bacilli.

CHOLERA BACTERIA AND FOODS.

DR. FRIEDRICH reports (*Arbeiten aus dem Kaiserlichen Gesundheitsamte*, Bd. viii. p. 465) the results of numerous experiments to determine the duration of life of comma bacilli in contact with various foods and drinks. On

the outer surface of fresh fruits and vegetables exposed to the ordinary temperature of the room, he found that with cherries, gooseberries, white currants, apricots, greengages, plums, damsons, pears, apples, radish-cabbage, onions, and lemons, the duration was one day. With peaches, cucumbers, pumpkins, carrots, two days; spinach and oranges, six days; and cauliflower, from three to five days. On the cut surfaces under the same conditions the results were, with red and white currants and raspberries, one hour; grapes, one to two hours; cranberries, two hours; sour cherries and whortleberries, three hours; lemons and peaches, five hours; oranges, three to twenty-four hours; gooseberries, two and a half to twenty-four hours; apricots, twenty to twenty-four hours; greengages, twenty-four to forty-eight hours; plums, six hours to five days; damsons, two to seven days; pears, one to four days; apples, six hours to seven days; cucumbers, five to seven days; onions, two to four days; carrots, three to nine days; pumpkins, twelve to fourteen days; radish-cabbage, three to eight days.

With drinks the following results were obtained: Unsterilized milk, one to two days; sterilized milk, ten days; tea, one hour to four days; coffee, two to five hours; four kinds of beer, three hours; white wine, five minutes; red wine, fifteen minutes; cider, twenty minutes. In cocoa they were still living at the end of seven days.

With other foods the results were: Fresh fish kept in a refrigerator, two days; smoked herring and salt herring, one day; caviare, exposed to the ordinary temperature, one day, and in the refrigerator, four to six days; Russian caviare under the same conditions, three to six days, and eight days respectively.

MEAT PRESERVATIVES.

VENZKE and SCHORER (*Deutsche Fleischerzeitung*, 1893, xxi., Nos. 20, 21, and 24) have made analyses of thirty-eight preservatives for meat, and report their ingredients to be as follows: One proved to consist of salt, sugar, and nitrate of potassium; four of salt, sulphite and sulphate of sodium; four of sulphite and sulphate of sodium; one of salt, sugar, sulphite and sulphate of sodium; one of salt, bicarbonate and nitrate of sodium; three of salt, boric acid, nitrate of potassium, and sulphate of sodium; one of salt, boric acid, and sulphate of sodium; one of salt, boric acid, gypsum, and sulphate of sodium; six of salt and boric acid; one of salt, nitrate of potassium, sulphates of sodium and calcium, and cochineal; one of salt and borax; two of salt, borax, and nitrate of potassium; two of salt, borax, and nitrate of sodium; one of salt, borax, sulphates of sodium and calcium, and salicylic acid; one of borax alone; five of calcium sulphite; one of molasses sugar; and two of borax and sugar.

E. POLENSKE (*Arbeiten aus dem Kaiserlichen Gesundheitsamte*, Band viii. p. 686) gives his results of further analyses of meat preservatives, seven in number: one consisted of salt, sulphate and sulphite of sodium, choride of iron, and vanillin; one was wholly acid sulphite of sodium; another was a mixture of sulphite and sulphate of sodium; a fourth consisted of salt, borax, and nitrate of potassium. A preservative obtained from American hams consisted chiefly of borax with small amounts of salt and nitrate of potassium.

"Powdered albumen," for sausages, consisted of albumen, non-nitrogenous organic matter, water, salt, and other mineral matter. "Chromosot" was found to contain 90 per cent. of sulphate and sulphite of sodium, with albumen, coloring matter, etc.

HYGIENE OF BARBER SHOPS.

DR. A. BLASCHKO (*Berliner Klinische Wochenschrift*, 1893) draws attention to the need of greater care for the prevention of the spread of disease by barbers. The most common, but not as is often asserted the only disease spread by barber shops, is herpes tonsurans. Many other diseases can be caused by shaving or by hair-dressing: impetigo contagiosa, acne varioliformis, trichorrhæxis nodosa, certain forms of eczema, alopecia areata, and syphilis. These diseases may be produced directly or indirectly: directly, when the operator himself is diseased; indirectly, when the disease is conveyed to another, either by the hands of the barber or by the implements of his trade—napkins, towels, razors, sponges, shaving-brushes, powder puffs, brushes, and combs.

In consequence of the unusual frequency of herpes tonsurans in Berlin, Köbner, several years ago, recommended the scalding of razors and shaving-brushes, separate shaving-brushes and clean towels for each customer, and separate puffs. In addition, it is advised to decline to serve those upon whom suspicion may rest as possible sources of contagion. In a very small minority of the shops, even of the better class in Berlin, are these recommendations heeded. Blaschko recommends wiping the razor with cotton-wool wet with absolute alcohol, scalding the shaving-brushes, the use of cotton-wool instead of puffs, the cotton used on each customer being thrown away, separate clean towels, or, when these cannot be afforded, the use of Chinese paper napkins. Furthermore, that every barber should have a separate set of instruments for those who are diseased or may be suspected—which recommendation has, of course, no great weight unless the barber is in a position to recognize such cases.

SANITARY REGULATION OF PILGRIM FAIRS.

MR. M. B. COLAH (*Indian Medico-Chirurgical Review*, 1893) advocates the interference of the Government, and prohibition of special trains to prevent the spread of cholera in India. Pilgrimages in India are of frequent occurrence. There are many minor pilgrimages every year, in almost every district, and large pilgrimages occur in various parts of India, which are attended by people from the most distant parts. These have been made much more possible by the improved railway facilities, and the attendance at fairs is always large and sometimes quite unmanageable. When outbreaks of cholera occur at these gatherings many die at the place, and many more return to their homes attacked with the disease, or with its germs in or on them, and the disease is thus widely disseminated. If the localities through which such pilgrims pass are in a sufficiently insanitary state, outbreaks readily occur, and as human intercourse is now much more extensive than ever before, outbreaks of cholera are heard of in the most distant parts of India. The action of the Government is confined to the issuing of notices by the local authorities, in-

forming the people of the danger incurred by attending fairs, and dissuading them from doing so; but this precautionary step is rendered nugatory by the railway companies, who run special trains and pour pilgrims into the place by thousands. Returning pilgrims should be subjected to some kind of sanitary inspection before being allowed to return to their homes from an infected centre.

At Hurdwar, the local authorities made every arrangement for the proper sanitation of the place, and took necessary precautions against the breaking out of epidemic disease during the fair. In spite of due foresight and care diarrhoea prevailed among the pilgrims, and cases of true cholera occurred. The fair was closed, the pilgrims were dispersed, and further arrivals were prohibited; whereupon the priests and other religious classes charged the authorities with having interfered with the religious observances, and the local government felt obliged to appoint a special commission to inquire into the several allegations.

CHOLERA AND RAGS.

IN regard to the attempt made in the House of Commons to raise again the question of the importation of rags from cholera-infected districts, it is worth bearing in mind that the whole matter was gone into at the Dresden Conference, and that it was then found impossible to lay hands on a single case in which infection could be traced to rags imported in compressed bales as ordinary articles of merchandise. It is quite otherwise in regard to the loose soiled linen of travellers from infected districts, but this does not come under the same classification. It is believed that the rags of merchandise are sometimes years in reaching their final destination at the shoddy mill or the paper manufactory. Not only is it quite unproved that such rags have ever given rise to cholera, but a consistent attempt to stop the introduction of infection by this means would demand an almost permanent prohibition of their importation.—*British Medical Journal*, 1893.

ACTION OF SOAPS ON CHOLERA BACILLI IN WATER.

DR. A. H. NIJLAND (*Archiv für Hygiene*, Bd. xviii., No. 4) gives the results of experiments undertaken to determine the influence of soaps on the bacilli of cholera in water. The ordinary soaps exert an injurious effect on the life of the bacilli even in relatively slight proportion. The addition of one and eight-tenths parts per thousand causes in a short time a marked diminution in their number, and in a quarter of an hour they are killed, provided the number present is not excessively large. The addition of disinfectants to the soaps increases their action in some cases, while in others, on the contrary, as when the addition is followed by a union of the constituents of the soap with the disinfectant, their influence is diminished. At the head of the list of disinfectant soaps in point of activity stands corrosive sublimate soap, which kills the bacilli in water within ten minutes when it is present in the extent of only three one-hundredth parts in a thousand. Not all the sublimate soaps in the market are of equal strength. Corrosive sublimate itself has greater power than all the different soaps, including the sublimate soap.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

JOHN SLADE ELY, M.D.,

PROFESSOR OF PATHOLOGY IN THE WOMAN'S MEDICAL COLLEGE OF THE NEW YORK INFIRMARY;
ASSISTANT IN PATHOLOGY IN THE COLLEGE OF PHYSICIANS AND SURGEONS; PATHOLOGIST
TO BELLEVUE HOSPITAL; AND ASSISTANT PHYSICIAN TO THE ROOSEVELT HOSPITAL
OUT-PATIENT DEPARTMENT.

IMMUNITY: EVIDENCE OF THE CORRECTNESS OF THE ANTITOXIN THEORY DEDUCIBLE FROM THE TREATMENT OF PNEUMONIA.

It will be remembered that in their first paper upon the induction of artificial immunity to pneumonia the brothers G. and F. KLEMPERER (*Berl. klin. Wochenschr.*, 1891, Nos. 34, 35) recount the results of tests of the therapeutic value of the serum of immunized rabbits in six cases of acute lobar pneumonia. They had previously demonstrated the harmlessness of injections of the serum in healthy persons, and, although the experiments at the time may have appeared somewhat premature, they have been in a measure justified by subsequent experience. In the six cases so treated the temperature fell in from six to twelve hours after the injection in four cases to the normal point, and the rapidity of both pulse and respiration decreased. In two cases the temperature remained normal after the initial fall, but in the others it rose again at the end of six hours or so.

While these results could not be regarded as in any way conclusive, they nevertheless stimulated similar tests by other observers, and we soon after find the report of a case similarly treated by FOÀ and CARBONE (*La Riforma Med.*, 1891, No. 256). In this, the first injection of 5 c.cm. of the blood-serum of an immune rabbit was followed, as in the Klemperer cases, by fall of temperature, pulse, and respiration, and a second like injection on the succeeding day brought about crisis on the fourth day of the disease, with resultant cure.

Following out the same line of experimentation with SCABIA, FOÀ (*La Riforma Med.*) soon got together ten cases of pneumonia in which injections of the blood-serum of immunized rabbits, on the second to the sixth day of the disease, were followed by apparent benefit. The injections were subcutaneous, in the scapular region, and the dosage was from 5 to 7 c.cm. at a time, repeated two or three times. In eight of the cases crisis occurred within twenty-four hours after the first injection; in two, not until the ninth and tenth day of the disease.

It will have been remarked that the experiments heretofore noticed have all been conducted with the blood of immunized rabbits. With a view to testing the efficacy of the serum of dogs, FOÀ and Scabia employed subcutaneous injections of the serum of a dog whose natural immunity had been reinforced by repeated inoculations of virulent pneumococci, in the treatment of two young persons suffering from pneumonia. In both cases the result was unfortunate, the temperature rising and the general condition of the patient being rather aggravated than improved, showing that the serum of the dog

is unsuited to such experiments. This last result further suggests the possibility of a difference between a natural and an acquired immunity, and that the natural immunity is not dependent upon the constant presence in the blood of an antitoxin, as was at first supposed.

Another series of ten cases is reported by JANSON (*Hygieia*, 1892. Cf. *Centralbl. f. Bakt. u. Parasit.*, 1892, xii., No. 1, p. 42). In these, doses of from 5 to 27 c.cm. of serum of immunized rabbits was introduced subcutaneously into the subclavicular region. In five cases the injections were followed by fall of temperature and other critical symptoms; in three others the temperature fell, but subsequently rose again; in one case, moribund at the time of the injection, there was temporary amelioration of all the symptoms; and in one case there was no evident result of the injection. The fall of temperature occurred in from two to four hours after the injection. Crisis occurred once on the fourth day of the disease, twice on the fifth day, and twice on the sixth.

A further interesting series of experiments is reported by NEISSER (*Deutsche med. Wochenschr.*, 1892, No. 25). Having demonstrated the protective and curative power, as regards the pneumo-septicæmia of rabbits, of the serum of patients convalescent from pneumonia, and having further satisfied himself of the correctness of Klemperer's view regarding the identity of the two diseases, Neisser, with the assistance of Prof. Lichtheim, tested the curative power of the serum of convalescents in other cases of pneumonia.

A young man, in the third day of a typical lobar pneumonia, in whose sputum the presence of virulent diplococci was proved, received an injection in the arm of 130 c.cm. of serum obtained by venesection from a convalescent two days after the crisis. The temperature soon sank, and in the evening became subnormal (97.7°), the pulse and respiration slowed, and convalescence continued without interruption.

A second patient, on the fourth day of the disease, received a similar injection of 70 c.cm. of the serum obtained from the last patient on the second day of convalescence. The temperature fell to the normal point on the same day, and remained normal till the sixth day thereafter, when, with moderate fever, a serous pleuritic exudate formed, but did not return after thoracentesis.

The curative power of this pleuritic exudate having been shown in the case of rabbits suffering from pneumo-septicæmia, it was used in a third case of pneumonia. This developed in the course of a case of influenza, but examination of the sputum demonstrated the presence of the diplococcus pneumoniæ of Fränkel and Weichselbaum. On the fourth day of the disease 50 c.c. of the pleuritic exudate was injected into a vein of the arm. The temperature fell nearly to the normal point, but rose again with the appearance of a small amount of pleuritic exudate, to fall to the normal, however, two days afterward.

In all of his cases Neisser noticed free sweating and slowing of the pulse and respiration as constant accompaniments of the fall in temperature.

We have thus records of thirty cases of pneumonia in which decided benefit seems to have followed the injection of serum of immune animals or of convalescents from pneumonia. If Klemperer's experiments, which resulted in the discovery of the "anti-pneumotoxin" are correct, we may fairly attribute the benefit observed to the presence of this substance in the blood injected,

and we then have in the cases above referred to additional evidence of the correctness of the antitoxin theory of immunity. But it may be objected that the evidence of benefit in the cases of pneumonia is equivocal, since in many untreated cases of that disease defervescence occurs early—on the fourth, fifth, or sixth day of the disease, and that little more than this was accomplished in the test cases. The regularity with which the critical symptoms followed upon the injections after an almost uniform interval of time seems to us, however, very forcibly to suggest a relationship of cause and effect between the treatment and the amelioration of the symptoms. And it should be remembered that at best such early crisis in untreated cases of pneumonia is exceptional. At all events, the harmlessness of the treatment is demonstrated, so that we may hope soon to be possessed of enough observations to remove all doubt.

ABSCESS OF THE HAND AS A COMPLICATION OF GONORRHOEA.

As a recent contribution to the long list of complications of gonorrhœa which have been shown to be due to the presence of the gonococcus in the remote lesion, we have the report of a case by HORWITZ (*Wiener klinische Wochenschrift*, 1893, No. 4), in which a young man, twenty-seven years old, who had suffered from gleet for a year, was affected by an abscess on the back of the hand. Examination of its contained pus showed the presence of the gonococcus of Neisser, both microscopically and in cultures.

In a carefully compiled introduction, Horwitz reviews the cases of a similar nature which had been published up to the time of his writing.

URINARY INFECTION: ITS CAUSES.

THE great importance of a correct knowledge of the nature of the various bacterial diseases of the urinary tract makes a recent contribution to the etiology of these diseases by KROGIUS of much interest (*Recherches bactériologiques sur l'Infection urinaire*. Helsingfors, 1892, 8vo., pp. 108). Krogius's observations extended to twenty-two carefully studied cases of urinary infection, some of them fatal, comprising cystitis, pyelo-nephritis, abscess of the bladder, and cases in which bacteria were present in the urine without apparent lesion of the urinary tract.

In all, five different species of bacteria were found, either acting as the causes of the various disorders or aggravating them by their presence. The most frequent of these was the bacillus coli communis, which was present in seventeen of the cases; proteus vulgaris occurred in two; staphylococcus pyogenes aureus in two; and the gonococcus in two. Commonly only one variety of micro-organism was present in each case; in three only was this not the case.

In four of the cases bacillus coli communis was found in the urine in large numbers without evidence of inflammation of the urinary tract, though in two of these there were fever and emaciation. The other cases in which bacillus coli communis was found, and those in which proteus vulgaris was present were of considerable severity, and in several the germs were detected after death in miliary abscesses of the kidneys, in abscesses of the bladder, in the blood, and in complicating lesions in various parts of the body. An important difference was observed between the cystitis caused by bacillus coli

communis and that of proteus vulgaris. In the former the reaction of the urine is acid, as the bacillus possesses only a slow decomposing action, while in the latter its reaction is strongly alkaline, proteus causing active ammoniacal fermentation. A marked difference in these germs as regards pathogenic power was disclosed by animal experiments. The mere introduction of a virulent culture of proteus into the bladder was sufficient to set up a decided cystitis, but artificial retention of urine was found to be a necessary adjuvant in the case of the bacillus.

ACUTE ULCERATIVE ENDOCARDITIS.

THE *Bulletin of the Johns Hopkins Hospital* contains the report by W. T. HOWARD, JR., of a case of acute ulcerative endocarditis due to the bacillus diphtheriæ. The lesion on the mitral valve was unmistakable, and Dr. Welch remarks, in commenting upon the case: "We found in pure culture and in large number in the valvular vegetations, the spleen, and the kidney, a bacillus absolutely indistinguishable from the Klebs-Loeffler bacillus of diphtheria in its morphological and cultural properties." The cultures were studied by Dr. Welch and by Dr. Abbott, of Philadelphia, with the result above quoted. Dr. Howard's bacillus was not pathogenic to guinea-pigs, but this can hardly be regarded as a valid point of distinction from Loeffler's bacillus, as the experiments of Roux and Yersin and of Abbott have shown that the genuine diphtheria bacillus may be devoid of pathogenic qualities as regards animals.

Admitting Howard's bacillus to be true diphtheria bacillus, we have here the first observation of its etiological relation to acute ulcerative endocarditis, and therewith an explanation of the occasional occurrence of endocarditis as a complication of diphtheria.

ON THE NATURE AND ORIGIN OF CASTS OF THE URINARY TUBULES.

THE question as to the exact nature of urinary casts has never reached a satisfactory solution, notwithstanding much study and discussion. The origin of the epithelial, blood, and granular varieties is easily apparent, but to what are we to attribute the formation of the very common hyaline casts? Are they a changed exudate from the bloodvessels of the kidney, or are they composed of degenerated protoplasm of tubular epithelium?

The discussion of this subject has recently been reopened by P. ERNST (*Ziegler's Beiträge*, xii. 553) who expresses his belief that hyaline casts are in great part composed of changed fibrin, basing this opinion chiefly upon the manner in which certain stains, particularly Weigert's "fibrin" stain, color the hyaline material of which the casts are composed.

This view is objected to by O. LUBARSCH (*Centralblatt für allgemeine Pathologie und pathologische Anatomie*, 1893, iv., No. 6, p. 209) on the grounds that a great variety of hyaline materials retain the color of Weigert's stain, although admittedly having nothing to do with fibrin; that the hyaline material of casts is furthermore stained by processes which fail to color fibrin; and that casts do not appear in those parts of the kidney in which exudations collect and where we should expect to find them were they the result of exudation from the bloodvessels. As the result of study of a large number of kidneys in various diseases, Lubarsch has found that fibrin occurs

in the tubules in acute inflammations of the organ, but rarely in the more chronic lesions, while it is in the chronic lesions more particularly that hyaline casts are abundant. Again, these could be found to have no special relation to the inflammatory processes in the kidney, but were closely associated with degenerative changes of various kinds. In some cases the conglomeration of small fragments of the degenerating epithelium, each fragment showing a hyaline appearance, could be seen. Lubarsch admits that occasionally the particles of degenerated epithelium may be cemented into solid casts by coagulated exudate. The exact nature of the degenerative change resulting in the formation of the hyaline material must at present remain unanswered.

RIBBERT (*Centralblatt f. allgemeine Pathologie und pathologische Anatomie*, 1893, iv., No. 11, p. 410) discusses the same subject but reaches a somewhat different conclusion. While admitting the justice of Lubarsch's criticism of the conclusion of Ernst in so far as it is based upon the results of particular methods of staining, and acknowledging that in many cases casts are undoubtedly derived from degenerated epithelial protoplasm, he is still of the opinion that in a large number of cases hyaline casts are nothing more than coagulated serum-albumin which has exuded from the bloodvessels, and has afterward, under the influence of certain chemical conditions, been coagulated into a formless transparent mass. This opinion is based upon observations made in the study of experimental nephritis induced in animals by exclusion of the blood from the kidney for an hour and a half by ligation of the renal artery. In this way an intense exudative nephritis was brought about on re-establishment of the circulation, and the tubules were found filled in many cases with clear serous exudate. When the kidney thus affected was subjected to heat or to the action of certain chemical agents this liquid exudate was coagulated into solid plugs in every particular resembling hyaline casts. In these cases, furthermore, degeneration of the tubular epithelium was insignificant and altogether too slight to act as a source of cast material. Ribbert also draws attention to the fact that when hyaline casts are found, albumin is either present in the urine at the time or has been present at an earlier stage of the disease, demonstrating the occurrence of exudation. When degeneration of the tubular epithelium alone occurs, as happens in some forms of poisoning and in some of the infectious diseases, hyaline casts are not found, though granular casts are usually exceedingly abundant.

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All communications should be addressed to

DR. EDWARD P. DAVIS, 250 South 21st Street, Philadelphia, U. S. A.

Or

DR. HECTOR MACKENZIE, 59 Welbeck St., Cavendish Sq., W., London, Eng.

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CARDIAC ASTHENIA, OR HEART-EXHAUSTION.

BY J. M. DA COSTA, M.D., LL.D.

It is my purpose to describe in this paper a form of weak heart that is not clearly recognized, yet that has features of its own. Weak heart, as it is commonly known, comes from organic causes, such as fatty degeneration, dilatation of the heart, myocarditis; or we notice it after acute diseases, as after typhoid fever, influenza, diphtheria, in which some special poison has affected the circulation; or as the result of more chronic poisoning by tobacco, alcohol, lithæmia, and gout; or of anæmia and deteriorated blood. But this is familiar knowledge, and not the kind of weak heart here to be investigated. I rather desire to examine the kind in which there is for a long period habitual feeble action of the heart, and in which this constitutes the essential and only appreciable disorder.

This heart-feebleness or heart-exhaustion comes from two causes: it is due either to nervous failure or to a weak heart muscle; in some instances to a combination of both. It will for the present serve our purposes best if these cases of essential weak heart from nervous causes are first described, and if we then endeavor to ascertain the signs by which they may be told apart from the instances of muscular weakness.

The affection generally manifests itself in those whose nervous system has been strained by worry or by overwork. It shows itself frequently by a veritable and sudden cardiac collapse, though the causes that have led to this become apparent enough when inquired into, and there have been warning signs. The patient is obliged to stay in bed; all attempts

at sitting up produce a sense of swooning and a vanishing pulse, or there is actual fainting from time to time. The heart's action is feeble, the pulse very small and compressible, and generally increased in frequency; there is a sense of uneasiness in the cardiac region, but very rarely actual pain; the extremities and the nose and ears are cold; the general temperature is somewhat below the norm. The capillary circulation is poor, the skin pale, occasionally injected or flushed; sweating is the exception. The breathing is conspicuously unaltered, although there may be a sense of oppression. "I am out of heart rather than out of breath," was the expression of a very observant patient, who added: "The heart has taken possession of the whole chest." The reflexes are unimpaired or sluggish. The appetite is poor, though there are no marked gastric symptoms; the bowels are constipated. Insomnia may be complained of; apprehension and low spirits are very common. From this state of depression and disturbed circulation the patient rallies but slowly. It is one or two months before he can sit up without inclination to faintness, and months more before he recovers. The course of the disease is as markedly chronic as the onset has been markedly rapid.

Let me cite some illustrative cases.

CASE I.—Mr. C., about forty-five years of age, of extremely regular and methodical habits, always very sparing in the use of tobacco, had been in good health barring slight dyspeptic difficulties and with them occasional palpitations, which, however, I had not found to be associated with any marked cardiac disorder until the spring of 1883. At that time he had several matters to worry him, and a sudden death in his family proved a great shock. He broke down at once; the heart's action became very rapid and feeble—so feeble that he had to remain in bed four weeks, and his head had to be lifted even from the pillow by the nurse, for any attempt to raise himself produced faintness and almost cessation of cardiac action, the pulse becoming imperceptible. There was coldness of the extremities, but no shortness of breath. The heart was both irregular and feeble, the first sound very short, and at times a faint, systolic apex murmur was perceived. There was an uneasy feeling in the cardiac region; no actual pain. A marked symptom was cold hands and feet, as was also tremulousness. He slept fairly well. The urine was free from albumin and sugar.

He remained seventeen weeks in the house, and then was taken to the seashore on a bed. During the remainder of the summer and autumn he improved slowly, but never got beyond the porch of his cottage, and was not able to return to his office until nine months after the breakdown. Even then the heart's action was very weak, and it took him two years to recover, all the time being most careful in his diet, in resting, and in the use of occasional doses of heart tonics, prominent among which were at one time *digitalis* and *nux vomica*.

Examined by me in May, 1892, I found him in excellent condition, though the circulation was still not strong, for occasionally the hands and feet were cold, and tremulousness manifested itself after meals, but the heart had given him, on the whole, no trouble, and it was absolutely regular in rhythm. He had no gouty symptoms, nor was there more

than very occasional indigestion. The tongue was clean; the pulse was 80; the first sound of the heart weak and indistinct, the second unchanged. The urine was acid, its specific gravity 1022, and it was free from albumin and sugar. He had had no palpitation for between four and five years, but he was still careful not to hurry, and to go slowly up and down stairs. One-fortieth of a grain of strychnia and a few grains of sulphate of iron were at that time given daily, and continued for a considerable period, and now, nearly eleven years after the original seizure, he is well and takes a usual amount of exercise without noticing that he has a heart. The impulse is normal, the first sound of good volume, the pulse 72; indeed, his cardiac symptoms are a thing of the past.

CASE II.—Mrs. W., twenty eight years of age, while in Europe two years ago, was placed on a very rigid diet for the cure of dyspeptic symptoms. Article of food after article was withdrawn; she felt herself growing weaker, and her friends noticed that she was becoming paler. In addition, she had had an attack of influenza during the winter, and had been under much worry. The urine was not albuminous, and there was no uterine disorder. Suddenly, in June, a collapse took place; the heart's action became extremely rapid and feeble, threatening to stop altogether, and for several days she had to be fed every three-quarters of an hour, and was also freely stimulated. If allowed to go longer without food, she became utterly exhausted and faint, though she only lost consciousness once. Even the food and stimulant were not sufficient to keep the circulation going, and repeated hypodermatic injections of ether had to be resorted to. She remained in bed for weeks, the least exertion producing faintness and vanishing pulse. There was no sweating, no marked shortness of breath; the extremities were cold, as was the face and nose, and several times the fingers became rigid, as if a convulsion were about to happen. When she was able to get out of bed a dropsical swelling attracted attention, but the urine, though scanty, was found free from albumin. About three months after the original syncope attack, she was able to go to Schwalbach, where the dropsical symptoms yielded, and her health markedly improved, but even now her heart's action is weak. Without cause, or after only slight fatigue, she becomes pale, the heart acts rapidly and irregularly, the feelings of faintness recur. The impulse of the heart is not strong; the first sound is short and feeble, the second distinct; there is no increased size of the heart, no murmur, and no pain. She can walk considerable distances without disturbance, but any worry or fatigue brings on an attack of failing circulation. There are at present no dyspeptic symptoms, but she is constipated; there is no decided uterine disorder, though within a year she has been treated for one. She inherits gout, and at times has excess of uric acid in the urine; for instance, an examination made last November showed a heavy deposit of urates, no albumin and no sugar, the specific gravity being 1030. *Nux vomica* and occasional courses of iron are the remedies that are chiefly used, besides a full diet.

In this case undoubtedly anæmia played a part, but it did not in the first case, nor in the one I am about to describe.

CASE III.—Mrs. B., a large woman of fine physique and strength, who had been overburdened with household matters, began, in the latter months of 1892, to be easily fatigued, had cold extremities, and attacks

like croup, followed by a complete breakdown, which confined her to bed. The appetite was poor, the respiration was normal, the temperature slightly elevated, about 99° ; the pulse variable, ranging between 60 and 90, and weak in volume. There was no cardiac murmur; the first sound was short. The urine was free from albumin. Sweating was an occasional symptom. She had severe fainting spells, and grew so weak that she could not raise her head from the pillow without an unpleasant feeling, as if she were going to faint. On strychnia, wine, food at short intervals, and massage, she improved for a few weeks, and then again became so ill that it was necessary to nourish her by the bowel because of extreme distress and palpitation following solid food. After this, under sustained nourishment, whiskey, which agreed with her better than any other stimulant, and arsenite of sodium, a gradual but steady improvement took place, though for several months a tendency to turn giddy and faint if she raised her hand above her head, as, for instance, to light the gas, remained. A trip to the seashore, in May, 1893, proved very beneficial, and on coming home she felt better than at any time since her illness began; the only sign remaining was that the calves of the legs swelled up during the day, the difference between morning and evening being about three inches. Since that time the improvement has been uninterrupted. All treatment, except the massage, has been for some months suspended, and this, too, has lately been stopped. There is no swelling in the legs. The heart's action is about 74. Her color is excellent, and she has a good appetite. No laryngeal attacks have happened for more than sixteen months. She is able to walk a great deal without fatigue, has a brilliant color, and is in better health than she has been for years.

In this case there was the unusual symptom of occasional decided elevation of temperature, though I do not know that it ever exceeded 101° . The color of the face was always good. The attacks, like spasmodic croup, I now believe were of nervous origin, and show how the nervous cardiac malady may coexist with other nerve disturbances or be replaced by them. Another illustration of this we shall presently study in Case V. The tendency to fainting is at times a very marked symptom. It proved itself so in the following instance, which was, however, not uncomplicated, as early in the case a slight amount of catarrhal jaundice also existed:

CASE IV.—I saw some years ago, with Dr. Hulshizer, an overworked young fisherman in whom there was irregular action as well as rapidity of action of the weak heart. The attack of cardiac disturbance was preceded by a slight gastric catarrh of at least six weeks' duration, with some yellowness of the conjunctivæ and mild catarrhal icterus. There was no fever. The urine was high-colored, but free from albumin. The heart-beat, when in bed, was from 130 to 140 in the minute, and tumultuous; about every sixth to eighth beat the impulse halted, and there was a disproportion between the pulse, which was about 90, and the heart's action, which was over 130. The first sound was very short and indistinct; the second distinct. There was no murmur and no enlargement. The respirations were not materially increased in frequency. Any attempt to assume the erect position produced greatly accelerated

action of the heart. He had been in this condition for upward of three months, having from one to thirty-five fainting spells daily. Any mental excitement was sure to bring these on; absolute rest in bed largely prevented them. He had no spells at night. Neither occasional mercurials followed by saline laxatives, nor a treatment by digitalis and strychnine, nor by adonidin, one-tenth of a grain four times a day, produced at first any decided effect; but, gradually under a very strict but sustaining diet, the use of a mixture of nux vomica, capsicum, bicarbonate of sodium and rhubarb, prescribed by Dr. Hulshizer, and holding the heart under control by digitalis, a complete recovery took place.

The rhythm of the heart is rarely as irregular as in the case just reported. The heart's action is mostly accelerated, but not irregular. It is very variable, always rises markedly after meals, and is influenced by the slightest exertion. I have the pulse record of a patient lying before me who took it, without my knowledge, many times a day, and in whom, even after he was able to be up, the pulse was 47 in the morning before the bath, and 88 after. In the same case the pulse, taken every hour and a half while sitting quietly in a chair, is noted at 76, 60, 56. Slow pulses, pulses under 60, are, however, quite the exception. The pulse is feeble, very compressible, at times almost imperceptible. The heart's action is influenced by position, but not to the extent to which I have seen the irritable heart influenced.

The physical signs of the heart disorder are very significant. There is no increased percussion dulness, the impulse is feeble, difficult to find, not diffuse. The first sound is short, lacking in volume, and may be obscure or short and valvular; the second is not accentuated. Excluding anæmic murmurs, which are very infrequent, since anæmia does not play an important part in the affection, we may have, though this is also rare, functional apex murmurs of dynamic origin, and these murmurs may be brought out, as shown by Dr. John K. Mitchell (*Transactions of the College of Physicians of Philadelphia*, 1892), by suddenly closing the hand tightly. A sensitiveness to touch in the cardiac region is at times noticed.

That the nervous system is very decidedly affected is evident. Indeed, most cases happen in those who from overwork or worry have had their nervous tone markedly lowered. The breakdown is primarily in the nervous system and not in the heart. The cardiac malady is throughout neurosial rather than muscular. It is very difficult to say to what part of the nervous system influencing the heart to ascribe the disorder. Granting that the central nervous system is affected, I am inclined to attribute the cardiac weakness more immediately to disturbances in the cardiac ganglia than in the centres in the medulla and to the disordered inhibitory influence of the vagus. The changed respiration seems to be against the view of the centres in the medulla being decidedly affected, as the centres for the heart and the respiration are there so closely connected.

The malady is not hysterical, as in the great majority of cases hysterical symptoms are conspicuously absent. But I have known them to come on when the case was of long duration, and I have seen two marked instances of this in men.

It is strange how the cardiac asthenia may be antecedent to or alternate with other manifestations of nerve disorder. We have seen something of the kind in Case III. I will now cite a case in which the cardiac affection preceded diabetes, evidently of nervous origin.

CASE V.—Mr. McB., thirty-seven years of age, was seen in the autumn of 1886 with Dr. McFerran. I found him in bed in a state of great prostration. He had not felt very well for some months, and had been anxious, very much overworked, and slightly dyspeptic for some time. On Sunday, on going to church, he nearly fainted and had to return home. Feeling somewhat better next day, he went out, but was soon obliged to return, reaching home with difficulty, and was forced to go to bed; even attempts to sit up in bed produced a sense of faintness and of cardiac uneasiness. When seen, he had been in bed two weeks. The pulse was weak and accelerated, the hands and feet cold, and at times moist with perspiration. There was no increased percussion dullness. The first sound of the heart was short, the second distinct; there was no murmur.

He remained in bed three weeks more, and was altogether eight weeks at home. During all this time the cardiac pain continued, but shortness of breath and palpitation only appeared on exertion; the first sound was short, the second very distinct. He had a good appetite. The urine, repeatedly examined, was found to be normal in specific gravity and in ingredients. There was facial neuralgia.

Seen in November, 1887, he looked pale, but was able to work four or five hours daily; he was sleepy in the afternoons; the hands and feet still felt cold at times. He had a large appetite, and was gaining flesh, but spoke of being thirsty. The tongue was clean, the bowels were regular. The pulse was 110, and still compressible; the first sound of the heart was somewhat valvular; there was no murmur. The urine was normal in quantity, and non-albuminous. Under strophanthus, phosphoric acid, digitalis and adonidin, given at different times, and shower baths, he greatly improved.

I did not see Mr. McB. again until the spring of 1888. He was in good condition, though the heart still palpitated. He remained fairly well all summer, though I believe late in the spring his digestion troubled him a little, and he had some boils. In September of 1888, he was not so well; he was again working too hard. The pulse was 100 and feeble. He had a little flush in the afternoons, but no dryness of skin. Chloride of barium, one-tenth of a grain, was given three times daily. After this he improved, and was not seen until early in December, when he reported that his legs ached, the stomach was disordered, the heart was rapid, varying between 96 and 120, but not irregular. He was losing flesh; the throat had been dry for a few days, and he was very thirsty. An examination of the urine, which had for some time been increased in quantity, showed the presence of sugar, with a specific gravity of 1030. He was placed on bromide of arsenic and an anti-diabetic diet, which was not well tolerated, and

he continued to grow weak, though no real attack of cardiac failure happened.

On December 18th, during the night, attacks which were described as spasms came on, after which he was very dull. On the next afternoon there was a recurrence of the so-called spasms, followed by great drowsiness, and he died in coma with all the signs of acetonæmia.

The disease is one of all ages except childhood and very old age. The great majority of my cases have been in men. I have seen a number of instances among physicians. It is always a long-drawn-out affection.

The diagnosis is not, as a rule, difficult. The evident nature of the causes that have given rise to the heart-wreck, its generally sudden onset, the unembarrassed breathing, the feebleness of the pulse and of the cardiac impulse, are full of significance. The physical signs as well as the state of the respiration and the clinical history separate the weak asthenic heart from the weak heart of organic type, such as the typical ones of this group—fatty degeneration and cardiac dilatation.

From other members of the functional group, as from the irritable heart, it is also distinguished by the history, by the fact that in this malady the patient has had a heart-strain or a gastric or an intestinal affection, that he is able to be about, that the heart's action is generally much more rapid, much more influenced by change of posture, that the impulse is sharp, jerky, diffuse, the pulse quick, small, not so faint, the second cardiac sound sharp and distinct. The tobacco heart resembles the asthenic heart much more closely. Indeed, I am inclined to believe that it is in the main identical, though stopping short in degree. We often observe the same feeble impulse, the feeble pulse—apt, however, to be more irregular and intermitting—respiration but slightly disturbed, a short, valvular first sound, and insomnia and nervousness. I found all these symptoms noted in a patient seen the other day, who smoked daily not less than twelve to fifteen of the strongest cigars obtainable, besides chewing incessantly, and in whom the pulse was 96, the respirations were 20; there was also tremor to such an extent that he could hardly write. It is further of interest to notice that in the experiments made by Hare (*The Physiological and Pathological Effects of the Use of Tobacco*, 1885), as well as by Benham, it is proved that nicotine does not act on the heart muscle, but influences the circulation through the heart's motor apparatus directly, or through the cardio-inhibitory centres in the medulla or the peripheral endings of the vagi or the ganglion of Ludwig.

The most difficult point in diagnosis is to distinguish the weak heart of nervous origin from those much rarer cases of inherent muscular weakness in which, however, no obvious disease of the muscle exists. I made these, at the beginning of this paper, the second group of weak

heart. It is very much rarer than the nervous form, and very much more persistent. The symptoms are the same as regards the feeble circulation, but there is this decided difference: shortness of breath, especially on exertion, is very common, and œdema of the ankles and insteps, passing though it be, is often met with. The physical signs in the heart do not differ, except that the first sign is more toneless, undefined, not so valvular; reduplication of either sound of the heart is much more usual, and so are functional dynamic apex murmurs. I have endeavored to ascertain whether the sphygmograph enables us to distinguish between these two groups of cases, but as yet without satisfactory result. The sphygmographic tracings in the nervous asthenic heart show a line of ascent not high and apt to be oblique, a rather sharp summit, and irregularity in the descent. In the weak muscular heart the upstroke is apt to be straighter, the irregularities in the diastolic period yet more marked. In either, the low tension may give rise to considerable amplitude in the upstroke. I will give the history of these cases of weak heart from weak muscle, which will show its character.

CASE VI.—Mr. S., a tall, thin man, of extremely temperate habits, but not of strong muscular system, came under my observation twelve years ago, with a feeble heart muscle. He had been pronounced to have dilatation of the heart, but had never shown any dropsical symptoms. I found the first sound of the heart very feeble, though not valvular; the second distinct. The pulse was rapid and small, and frequently 96. There was no increased percussion dulness. He had a tendency to clamminess of the skin. There was slight shortness of breath on exertion, as well as oppression. He was not a dyspeptic; he had at one time used a great deal of tobacco. The urine presented nothing abnormal, and the eye-ground showed nothing wrong. The pulse is always weak, but he does very well unless he exerts himself too much, when his heart becomes rapid and somewhat irregular, and a feeling of soreness in the cardiac region is complained of. A day or two of rest on his back always makes him feel better. He is very sensitive to the action of drugs. Digitalis does not suit him, nor does strophanthus answer a good purpose; he does best on *ignatia amara* or on strychnine. Nevertheless, by careful living, and by using from time to time courses of *ignatia* or strychnine, years have passed, and he is now in better general condition, though still with a weak heart, than when he came under observation in 1881. It has become possible for him to go nine or ten months without treatment; three or four were formerly his utmost limit.

The next case is one in which the cardiac symptoms are still more marked, and in which intermittent mitral murmur and dropsical symptoms due, I believe, to temporary dilatation, were observed. It, too, has been many years under observation.

CASE VII.—A spare, active man, now in the early sixties, has been under my observation for fully fifteen years. There is never a time

when the feeble action of his heart is not manifest; the impulse is always found to be weak, not diffused; the first sound is dull and lacking in volume, the second distinct; the pulse is generally about 72, compressible, and at times irregular. Ordinarily there is no shortness of breath, but it occurs on exertion. There is no anæmia, no disease of the kidney, and the digestive powers are fair. A curious feature of the case is an intermittent cardiac murmur, systolic and mitral—not harsh; it may be noticed for a week or two at a time, and then disappears. The patient has had dropsical swelling of the ankles, from which, however, he has entirely recovered. He was once, while travelling, when he had fatigued himself, seized with an attack of cardiac weakness so marked that but for the prompt attention of a physician who was with him he would probably have died. Notwithstanding his weak heart, he does a great deal of active professional work.

The heart-muscle in these long-standing cases is probably flabby. I doubt if it presents marked organic change. It may be that in very chronic cases a slow form of myocarditis exists, but of this I have no evidence. I am, however, certain that dilatation of the heart and insufficiency of the mitral valve may finally come on, and the affection thus become one of pronounced organic kind.

CASE VIII.—A young lady of delicate physique, whose case I watched from early womanhood, had always a very weak heart, a feeble impulse, a short, ill-defined first sound, a second sound of moderate distinctness, no murmur, and no increased percussion dulness. She never had much color, but was not anæmic. Walking in a strong wind put her out of breath, as did going up stairs. Everything was done to improve her general health, but the heart-muscle remained feeble. She married, but was childless. Gradually the shortness of breath became a more marked symptom, especially by periods in connection with signs of congestion of the lungs. The heart evidently dilated, the transverse percussion dulness increased, and a systolic murmur became manifest and persistent. Finally dropsical symptoms supervened, and she died with all the symptoms of a mitral disease with cardiac dilatation. She was a long time under observation, and it was six or seven years from the time I first saw her until the weak heart dilated and the signs of organic disease appeared.

These cases will, I think, make evident the manifestations and history of weak hearts where the heart-muscle is essentially weak, and show their course to be different from the asthenic nervous heart. There are mixed cases undoubtedly, cases in which from worry or overwork heart-exhaustion has been superadded to feeble muscle. Here the disorders are very difficult of separation, though even here an accurate history may tell us how much value to attach to either.

In the asthenic nervous heart the prognosis is very good. Under treatment and in time they all recover. There is danger from so-called heart-failure, but I have never met with an instance. I cannot say the same for the heart weak from muscle weakness. I remember one

instance that I saw with a medical friend, in which with only a very moderate amount of bronchitis a sudden and unlooked-for fatal collapse occurred. The epidemic of influenza through which we have been passing has given me the opportunity of witnessing how badly these weak hearts bear the strain of acute disease. In two instances in which I had known of the existence of the feeble heart-muscle for years, life was only saved by the most strenuous exertions; in one, the issue was for days doubtful. On the other hand, in the asthenic nervous heart, certainly when it has once regained its tone, acute disease does not produce fresh heart-exhaustion. Thus I saw, eight years ago, with Dr. Louis Starr, the case of Mrs. H., a middle-aged woman, with weak nervous heart and a tendency to faintness on raising her head from the pillow. The extremities were cold, there was no chest pain and no shortness of breath. She recovered completely, chiefly under the steady use of *nux vomica*. Four years ago, during influenza, she had an attack of pneumonia, and was very ill, but recovered, and had subsequently, about two years after this, a more limited slight attack, which she bore well, and is now in good health.

The treatment judged most advisable has in part become evident from the cases reported. But it may be well to give a summary of results. For the cases of the asthenic nervous heart, rest in bed is at first essential, and, when they are able to sit up, nothing does them so much good as graduated shower-baths. Massage, too, may be employed, but many cannot at first bear it, and it comes in better at a later stage of the treatment. It is then, too, that Swedish movements may be recommended, and carefully adjusted exercise, such as walking, or gentle horse-back exercise, or light gymnastics. These agents can be resorted to from the start, where the weak heart depends on a weak heart-muscle. From Swedish movements that are specially adapted to promote the flow of blood and to strengthen the heart, I have seen in this class of cases great good. The action of the heart has become distinctly stronger and more regular, and in young persons I believe a permanent curative result may be accomplished. The food should always be as nutritious as possible, taken as frequently and in amount as large as the digestion will readily tolerate, and stimulants often have to be resorted to. It is astonishing in what quantities they are borne, and temporarily even required, in the nervous heart; though, for fear of forming a habit, we have to withdraw them as soon as the circulation strengthens. The tendency to constipation demands attention, and is to be remedied by means of diet and of light laxatives.

Among drugs strychnine stands pre-eminent. It is suitable to both the forms of weak heart under discussion. The dose need not be large—rarely exceeding one-thirtieth of a grain three times daily—but it must be continuous. Iron is not called for except when a complication with anæmia exists, or later in the case as a general tonic, and its

tendency to constipate makes it often a doubtful remedy. Arsenic, in the nervous asthenic heart, comes next to strychnine. Its action cannot be explained by its removing anæmia, for it proves to be valuable where the blood-count shows this not to exist. I have the record of one case in which the patient, who also suffered from hay asthma, began its use for the cure of this, and, finding the arsenic very strengthening to his heart, continued it of his own accord for four months, in doses of one-hundredth of a grain of arsenite of sodium three times daily, with the greatest benefit to his general health and a permanent removal of the heart symptoms.

Of so-called heart tonics digitalis is the best, but it is not the certain remedy we might suppose. It is on the whole best adapted to the cases with muscle weakness. Where we give it in large doses the patient should be kept in bed. In a number of instances it does not suit at all. *Strophanthus* is generally said to be inferior to digitalis. I have used most of the other remedies of this class in different cases. Adonidin and chloride of barium have done me at times good service; cactus and convallaria have been disappointing. The latter I have ceased to use. Caffeine and cocaine are both valuable, but their action cannot be kept up; from cocaine we would run the risk of establishing the cocaine habit. It is, however, very serviceable during urgent symptoms of failing heart. Nitroglycerin is not of much avail, except there be cardiac pain, or in combination with remedies like digitalis, which act more distinctly on the force of the heart. Bromides, valerian, and opium ought to be left to meet special indications of nervous disturbance.

A CASE OF NON-HEREDITARY FRIEDREICH'S DISEASE.

BY HECTOR W. G. MACKENZIE, M.A., M.D. CANTAB., F.R.C.P. LOND.,
ASSISTANT PHYSICIAN TO ST. THOMAS' HOSPITAL AND TO THE BROMPTON HOSPITAL
FOR CONSUMPTION, LONDON.

ISOLATED cases of Friedreich's disease have been sufficiently rarely recorded to justify the publication of the following example, which I had recently the honor of showing at a meeting of the Neurological Society of London. It is possible that the prevalence of the idea that the disease necessarily affects several members of the same family may have something to do with preventing its due recognition, when only one out of a family suffers. It is, therefore, important to emphasize with an example such as this the fact that the disease does occur in an isolated form. That it does do so is a good illustration of the wisdom of giving a disease a name which implies nothing as to its special characteristics;

for to this kind of case the alternative title of hereditary ataxia for Friedreich's disease is quite inappropriate, unless it is taken to imply future possibilities.

Rose H., aged thirteen years, was admitted under my care to St. Thomas' Hospital on November 1, 1893, on account of difficulty in walking. She had been, in the first place, sent from the country to see my colleague Mr. Battle, on account of lateral curvature of the spine; and he, recognizing the ataxy, the absence of knee-jerks, etc., asked me to take her under my care.

The history of her illness was as follows: When seven years of age she had measles, and from that date she became weak on her legs. After a time she was observed to limp and fall about and she complained of giddiness on standing and walking. She was said to have been always fairly intelligent, but she was not very successful in writing or doing needlework, owing to jerky movements of her hands. Her doctor in the country, who had been consulted about her shortly before she was brought to the hospital, recognized that she had curvature of the spine; but I did not learn whether his attention had been attracted by the nervous symptoms.

The family history was very good and showed an entire freedom from any tendency to nervous disorder. The grandmother was living and well, aged eighty years. Both parents and two brothers and five sisters were alive and in good health. Four of the sisters were older—aged respectively twenty-three, two (twins) seventeen, and sixteen—while one was younger, aged five. The two brothers were eleven and fourteen respectively.

The child herself was well nourished and healthy-looking. She was intelligent, placid and good-tempered, and became a great favorite with the other patients and the nurses.

Her gait was very distinctly unsteady, clumsy and jerky. She walked on the front part of her feet, with her head and the upper part of the body forward, and as she went along swayed from one side to the other, something after the fashion of a sailor's roll. She had a tendency, as she walked, to deviate from the straight line to one side, commonly to the right, but sometimes to the left. The swaying and unsteadiness became specially marked when she turned round to retrace her steps. When she tried to stand with her feet together and eyes shut, she tottered and would have fallen unless supported. The child said that when standing or walking she felt as if her head was turning round.

There were occasional jerky movements of the head and arms. She was not very successful in her attempts at touching her nose with the forefinger with her eyes shut, or in bringing her two fingers accurately together. The knee-jerks were quite absent.

The pupils were equal, of medium size, and reacted well both to light and accommodation. There was no oculo-motor paralysis. The ophthalmoscopic appearances were normal. Nystagmus was at first thought to be absent, but was subsequently observed to be distinctly present in a slight degree when the patient looked outward to either side.

The muscular development was good, and there was no perceptible weakness in any of the movements of the limbs. There was no affection of speech, and none of sensation, and there were no pains and no crises. There was decided lateral curvature of the spine, the upper

curve having its convexity toward the right and involving the upper dorsal vertebræ, while the lower curve had its convexity toward the left and involved the lower dorsal and upper lumbar vertebræ. The various organs were healthy.

With regard to diagnosis, one had to consider locomotor ataxy and cerebellar tumor in addition to Friedreich's disease. Cerebellar tumor could be excluded by the duration and progress of the disease and the absence of such characteristic symptoms as headache, vomiting, and optic neuritis. In differentiating between locomotor ataxy and Friedreich's disease the following points were of importance.

1. The age was the usual one for the latter and would have been very uncommon for the former.

2. The onset after measles has been previously noticed in cases of Friedreich's disease, especially by Dr. Ormerod. No such relation is known to exist in regard to locomotor ataxy.

3. Syphilis is considered by Dr. Gowers as one of the commonest causes, if not almost the only cause of locomotor ataxy. In this case there was no history and no sign of syphilis.

4. The presence of jerky movements of the arms and head, and the swaying unsteady gait were peculiarly characteristic of Friedreich's disease.

5. Nystagmus was valuable as being a fairly constant symptom of Friedreich's disease, while absent in tabes.

6. The absence of lightning pains, anæsthesia, crises, Argyll-Robertson pupil, and optic atrophy, although the duration had been six years, pointed away from tabes.

7. Although the speech was unaffected, this was not of great moment, as the affection of speech in Friedreich's disease is often a late phenomenon and may remain altogether absent.

8. The complication of lateral curvature has been previously observed in cases of Friedreich's disease, but not, as far as I am aware, in locomotor ataxy.

Such were my reasons for my diagnosis. Had the disease occurred in other members of the family it would not have been necessary to state them so fully. I may add, my opinion was confirmed at the meeting of the Neurological Society by Drs. Ferrier, Beevor, Ormerod, and others.

I have not attempted any treatment with drugs, but a very marked improvement was observed after a few weeks' stay in the hospital, probably the effect of good food and a greater amount of repose. The essential features remained, but the incoördination and the jerkiness were notably diminished. Had I given any particular drug, I might have been, perhaps, induced to believe that the improvement resulted from the drug. Such improvement I have frequently observed in hospital in nervous disorders of organic origin. It is on that account that I

strongly deprecate the premature publication of the supposed beneficial effects of new modes of treatment in such cases, of which so much has been heard of late. So far as is at present known, the course of Friedreich's disease is uninfluenced by the administration of any drug.

ON THE MORTALITY AFTER OPERATIONS FOR STRANGULATED HERNIA; THE TREATMENT OF GANGRENOUS INTESTINE, AND THE RADICAL CURE OF HERNIA.

BY JOHN CROFT, F.R.C.S. ENG.,

CONSULTING SURGEON, AND FORMERLY LECTURER ON CLINICAL SURGERY, TO ST. THOMAS' HOSPITAL, LONDON.

It may be remembered that in April and May last (1893), under the headings of "Treatment of Gangrenous Hernia" and "Mortality After Operation for Strangulated Hernia," first reports of what was said at a meeting of the Medical and Chirurgical Society of London appeared in the *Lancet* for April 8th, and then a letter followed in the same journal for May 20th. I give the particular references: "Resection of Intestine and Immediate Suture in Cases of Gangrenous Hernia," by Mr. Kendal Franks, *Lancet*, 1893, vol. i. p. 794, and "The Mortality After Operation for Strangulated Hernia," by Mr. Bowlby, *Lancet*, 1893, vol. i. p. 1221.

In the discussion on Mr. Kendal Franks' paper, Mr. Bowlby's remarks included statements on the rate of "mortality after operations for strangulated hernia." This statement was commented on in a leading article in the *Lancet* for May 6th, in the following terms: "Mr. Bowlby stated that, taking all the operations for strangulated hernia performed in St. Bartholomew's Hospital during the last ten years, they showed a mortality of 40 per cent. It would be interesting to know to what this very high death-rate is to be ascribed."

Mr. Bowlby's letter of reply to that part of the leader appeared on May 20th, p. 1221 of the *Lancet*.

After reading the reports of the discussion and the letter, I think the following conclusions will be found correct:

First, that the mortality after operations for strangulated hernia, according to Mr. Berry, as quoted by Mr. Bowlby, was, up to 1884, 43 per cent. on 940 cases treated consecutively at St. Thomas', Guy's, and St. Bartholomew's Hospitals, London; secondly, that in 1891 Mr. Treves, as quoted by Mr. Bowlby, gave the mortality at the London Hospital at nearly 50 per cent.; and thirdly, that on further investigation Mr. Bowlby has found that the mortality at St. Bartholomew's for the last ten years was at the rate of 35.82 per cent.

Since the period at which Mr. Bowlby's letter appeared, I have finished tabulating my operations for hernia, beginning with May, 1866, and ending October, 1892.

The number of cases operated on for strangulated hernia and of which I can obtain notes amounts to 94. These I have arranged into two chief groups, viz., those operated on in pre-antiseptic times, and those operated on with antiseptic precautions. In the latter group there are 44 cases, including 13 deaths, yielding a mortality at the rate of $29\frac{1}{2}$ per cent.

This gives a difference in my favor of 5 per cent.

I imagine that the rate after complete antiseptic operations for strangulated hernia will not be found to vary to any great extent at the several London hospitals. However, the difference between the mortality which obtained before the thorough use of antiseptics, and that which has obtained since the institution of antiseptic or aseptic surgery, is very marked.

My tables include 50 cases operated on in the pre-antiseptic times. The mortality in those cases exceeded 50 per cent., or the rate of mortality ascribed to the practice at the London Hospital by Mr. Treves.

My own personal experience, therefore, shows a reduction of mortality from 50 per cent to $29\frac{1}{2}$ per cent.

It would appear that Mr. Treves, when he described the mortality at the London Hospital as at the rate of 50 per cent., must have included cases operated on without antiseptics.

At St. Bartholomew's the death-rate in the antiseptic period is as high as 35.8 per cent.

I quite agree with Mr. Bowlby when he writes in the letter already alluded to, that "most of the deaths after operations for strangulated hernia are due to exhaustion resulting from compulsory starvation of several days' duration, as well as from continuous retching, vomiting, and pain."

I have analyzed the causes of death in the 13 cases in which the operation for strangulated hernia had been performed antiseptically, and find that 9 deaths occurred from exhaustion from protracted sufferings and old age, that in 3 of these the gut was gangrenous, and that 5 were nearly moribund at the time of operation. None of the other 4 cases died of peritonitis.

An analysis of the causes of death after operation in the pre-antiseptic days, shows that 16 died of peritonitis or exhaustion from protracted sufferings and feeble old age, and 5 from erysipelas or pyæmia.

By operating antiseptically we have practically eliminated peritonitis as a cause of death from operations for strangulated hernia, and we have even got some little distance on the road toward diminishing the number of hopeless cases submitted to hospital surgeons. The good results obtained by antiseptic or aseptic surgery are encouraging patients to submit earlier to an operation which includes a radical cure, and the same good

results are encouraging an improving class of general practitioners to call in the aid of the operating surgeon at a correspondingly earlier date.

The responsibility incurred by the general practitioner when he delays to submit his patient who is suffering from an obstructed hernia, to the operating surgeon, is so great that one wonders at his failing to quickly divest himself of it.

ARTIFICIAL ANUS, AND PRIMARY RESECTION AND SUTURE.—Amongst the 94 cases of strangulated hernia there were 10 cases in which I thought it necessary to make an artificial anus. In each instance the bowel was gangrenous.

A very large proportion, viz., 7, of these occurred in the pre-antiseptic period. In each of these the bowel was in a state of gangrene more or less advanced.

I feel sure that in 4 of these the operation of primary resection and suture could not have been borne, owing to the already exhausted condition of the patients; one died an hour after operation, another two hours after, another twelve hours after, and another survived six days. This last was a woman of eighty years of age, who had been suffering already for nearly a fortnight.

The 3 others in this group of 7 were less unfavorable cases, and I believe that two of them might have borne the operation for primary resection and suture, but that is as much as I could have ventured to predict.

Amongst the 44 cases operated on in the antiseptic period, there were only 3 instances of artificial anus. Not one of these could have borne the prolonged operation of primary resection and suture. The youngest, who had diseased kidneys, sank in eighteen hours after operation, and the other two, who were aged women, succumbed each in a few hours.

It seems remarkable that in the first 50 cases there should have occurred 10 instances requiring artificial anus, and that in the second group of 44 there should have been no more than 3.

If we examine this fact by the light of the chief causes of the condition of the bowel requiring the formation of an artificial anus, we may perhaps find an elucidation of it. The three chief causes of gangrene of bowel in strangulated hernia are, first, acuteness of strangulation; secondly, long duration of the condition before operation; and thirdly, frequent forcible attempts at reduction. The tables cannot be made to throw any light upon the first and third causes, but on the second cause they yield an interesting gleam. In the first 50, the tables show that 28 patients had been suffering for more than two days, and that in the second group of 44 cases the number that had suffered for more than that length of time had dropped down to 19. In the first group 9 had suffered for over four days, whereas in the second group only 5 had so

suffered. I do not say that this is a complete elucidation of the fact I have referred to, but it is sufficient to show that the duration of the strangulation is a powerful factor, though not the only one, in producing the gangrenous state of intestine.

I am conscious that in treating the cases in the second group of 44 I submitted those patients whom I could influence by advice, to operation as early as possible, with the double purpose of arresting the symptoms of strangulation, and of radically curing the hernia.

PRIMARY RESECTION AND SUTURE.—On reviewing the 13 cases in which I resorted to the formation of an artificial anus, it will be observed that all died, and that I did not attempt primary resection in any case. I cannot forbear, however, from taking this opportunity of expressing my sympathy with those who have been endeavoring to improve the methods of dealing with these desperate cases of gangrenous intestine. The number of instances in which English surgeons have practised primary resection for this condition is very limited, so far as I know. Mr. Kendal Franks' table of 220 cases, supplied with his most interesting and able paper to the Medical and Chirurgical Society of London in March last, contains only a few scattered cases belonging to English surgeons of pre-antiseptic and antiseptic times. The surgeons who have provided the largest group in the table are Kocher, Hagedorn, and Mikulicz, and these together supply some 55 cases. Their results are brilliant. I am quite in accord with those who think that successful primary resection and suture is a preferable operation to the primary formation of an artificial anus, which must be followed by a secondary resection and suture; but I cannot agree with those who would settle this question by the mortality statistics (including cases of pre-antiseptic times) of the respective operations. The cause of failure in the cases of artificial anus, made to relieve strangulated hernia, is not in the operation itself or in its immediate effects, but the causes of death are in the conditions which have preceded and accompanied the gangrene.

Gangrenous intestine is not a condition to be treated by a hard-and-fast rule.

One of the first requirements in the consideration of the question of what to do with gangrenous gut is to come to a general understanding of what is meant by gangrenous intestine, for the purpose of the surgeon. For him a portion of bowel which is prospectively dying or dead is gangrenous, though it may not be entirely so or pathologically so. If it is dying and septic, it would be best to treat it by excision and antiseptics. If it is not dying and not septic, then such radical treatment is not called for. Dr. K. Franks thinks that his statistics "show that (a) intestinal resection and suture should be the operation of choice in gangrenous hernia, and that (b) simple enterotomy followed by artificial anus should

be reserved for absolutely special cases, and should be considered as an exceptional procedure."

This is equivalent to saying that each case must be dealt with on its merits.

ON REMOVING OMENTUM IN CASES OF STRANGULATED HERNIA.—I find by my tables that on the total of 94 cases, omentum in greater or smaller quantity had to be dealt with in 35 cases.

In the pre-antiseptic days the mortality in cases in which omentum had been interfered with or removed amounted to 10 out of 15 cases; whereas in the antiseptic period there were 20 cases and only 1 death. In 17 of the 20 cases the omentum had been ligatured and cut away. This shows a marvellous improvement in results.

I am sure that it is wiser to cut off the omentum antiseptically than to run the risk of bruising and even tearing it by pushing it back through a relatively narrow orifice. When in doubt, remove it antiseptically, is, I believe, a good rule.

SHOULD RADICAL CURE BE ATTEMPTED IN OPERATIONS FOR RADICAL HERNIA?—Among the 44 cases of strangulated hernia operated on antiseptically, I find that in 21 the proceeding was completed by an operation for a radical cure. In 19 the result was entirely satisfactory, the cure being rapid in all cases. In two patients the cure was frustrated by death from a cause overlooked at the time of the operation. One man died from internal strangulation by a band which must have existed concurrently with the hernia, and the other patient succumbed on the thirteenth day, from diarrhœa caused by intra-peritoneal incarceration of small intestine. Peritonitis was not the cause of death in either case.

I would say, that all patients suffering from strangulated hernia should be given the advantage of a radical cure; and I would go farther, and say that all patients suffering from obstructed hernia should be advised to submit to early operation and radical cure.

The 21 cases referred to, include two cases in which the testicle was removed at the same time, one in which the atrophied ovary and Fallopian tube were removed, and several where large masses of omentum were ligatured in segments and cut off.

In treating the tunica vaginalis testis in instances of congenital hernia, I adopted one of two plans: either to make a new tunica by suturing up the portion of the sac attached to the testis, or to trim away the sac close up to the organ. This latter plan gave as good results as the first, and had the merit of economizing time.

RADICAL CURE OF HERNIA.—As I have frequently mentioned this subject, perhaps I may be permitted to add a few words with respect to the particular mode of operating of which I have had experience.

I have memoranda of 57 cases in which the radical operation was carried out, 21 of strangulated hernia and 36 of non-strangulated hernia.

I have removed the sac in all cases.

I attached great importance to placing the ligature high up on the neck of the sac. In many cases of inguinal hernia I fastened one loose end of the sac-ligature to the internal oblique and inner pillar of the ring; but I doubted the value of it. In almost all instances of inguinal hernia I brought together the pillars of the ring by sutures, at the same time avoiding any pressure on the constituents of the spermatic cord. I have employed for sutures and ligatures prepared catgut, kangaroo-tail tendon, and silk. I give the preference to silk as more durable and reliable.

In the treatment of the femoral hernia I contented myself with ligature of the sac at its neck and its abscission.

PERNICIOUS MALARIAL FEVER.

By GEORGE DOCK, M.D.,
OF ANN ARBOR, MICHIGAN.

IN the modern study of malaria, etiology and diagnosis have progressed much more rapidly than pathology. The discovery of the parasites by Laveran destroyed the elaborate and often ingenious explanations of the phenomena of the disease which had been formulated up to that time, and the recognition of the fact that in the earlier anatomical studies the parasites were not accurately observed made it obvious that the histological lesions must be re-studied. Malarial diseases differ from most infectious diseases in that although the infection is always and only in the blood—is, in an old and still used sense, general—yet the clinical features vary to a marked extent in different cases. It must be clear that in the new study of malaria many single observations must precede a complete survey of the subject. In the following pages I present the results of the study of a limited material. I have devoted most space to the study of a single case which offered unusual advantages in several respects, especially in the previous health of the patient and the short and severe course of the infection. The older writers had a very extensive list of varieties of pernicious malaria for the purpose of expressing briefly the salient features of different cases. As usual in such cases, one name does not always suffice, so that in my own case one might be in doubt whether to call it hæmaturic, remittent, gastric, or dyspnœic. Looked at from the modern standpoint, we should ascribe chief importance to a feature the older terminology did not include, viz., the rapid destruction of red blood-corpuscles. I have given the history of this case rather in detail. The rest of my material

was derived from a case of algid pernicious malaria without unusual features, and two cases of malaria of milder type in which death occurred from accidental rupture of the spleen.¹ I have also used the liver of an old case of malaria preserved in the Pathological Institute of the University of Leipzig.

The points of special importance exhibited in this case are the enormous development of the parasites and consequent anæmia and melanæmia; the parenchymatous degeneration and inflammation in liver, kidneys, and stomach; the thrombosis in various organs; a remarkable condition of the blood in the abdominal fatty tissue, and finally, the micro-chemical examinations of the tissues.²

Acute malarial infection; remittent fever, emesis, dyspnœa, hæmaturia, and delirium; death on the seventh day, from failure of respiration. Post-mortem: Melanæmia; thrombosis; necrosis and inflammation of liver, kidneys, and stomach; hyperplasia of spleen and lymphatic glands, etc. G. P., aged twenty-three years, born in England, emigrated to America in 1890. Landing in Galveston, Texas, he worked for a few weeks on vessels in non-malarial localities. In August, 1890, he took a position on a steamer plying between Galveston and San Jacinto, Texas, a place where the most severe forms of malarial disease occur. P. made weekly trips to San Jacinto, remaining there from two to four days, and, the weather being warm, slept on deck, close to the shore. Up to October 25th, P. was in perfect health, never having been ill in his life. On the day named, on the trip to Galveston, he felt pain in the abdomen, and slight nausea. These symptoms passed away, and he slept well the following night. Next day, about 10 o'clock A.M., he had headache and a slight chill, followed by fever and sweating. From that time he thought he had fever constantly, but without chills and sweating. On the 27th he vomited without obvious cause. Appetite remained fairly good. On the 30th, on account of the constant fever and increasing weakness, P. sought admission to the hospital. He had taken no medicine but a cathartic pill, which had a mild effect. At 5 P.M. the same day the following *status* was taken:

"Man of medium size, well developed and well nourished. Mind clear, but slightly excited. Complains of constant severe pain in the frontal region and in the back and legs. The skin is pale and dry. There is no jaundice. There are recent herpes vesicles on the lips. The tongue is swollen and indented, with a gray coating. At rare intervals patient vomits bile-stained, mucous, watery fluid. The bowels are confined. Splenic dulness extends from the eighth rib three fingerbreadths beyond the costal margin. The splenic region is sensitive to pressure; the spleen can be felt, but is very soft. There is marked tenderness in the epigastrium. The liver is not distinctly enlarged. Temperature (5 P.M.), 100° F.; pulse, 88."

¹ University Medical Magazine, vol. i. p. 469.

² The later examinations were made in the Pathological Laboratory of the University of Leipzig, and I wish to thank the Director, Professor Birch-Hirschfeld, for giving me the freedom of the Laboratory and for many other kindnesses, and to thank the assistants, Privat-docent Dr. George Schmorl and Dr. Richard Kockel, for valuable assistance. I am especially indebted to Dr. Schmorl (whose reputation for unexcelled work in photo-micrography is well established) for the negatives from which the accompanying figures have been made.

The examination of the blood, which at once revealed a severe malarial infection, will be described later.

During the next twelve hours the patient took thirty grains of quinine, in solution, by the mouth, without symptoms of cinchonism.

The patient's condition remained about the same until noon the next day, when a sudden change for the worse was observed. The pulse was weak, from 150 to 160 to the minute. Severe and uncontrollable vomiting set in. Neither medicine nor food could be retained, and even attempts to swallow bits of ice or carbonated water caused violent retching. Later delirium came on, at first mild and voluble, later somewhat wild. The temperature, which had ranged between 99° and 101° , rose suddenly, reaching 104.8° at 3 P.M. It then fell slowly to 103.6° at 6 P.M., and remained stationary until death. During the afternoon dyspnoea appeared and became more and more severe, so that if the patient attempted to rise he would fall back exhausted. Finally, at 8.15 P.M., breathing ceased, the heart beating for several minutes later.

On the day of admission, through some oversight, the urine was not saved. The next day none was passed, so that at 6 P.M. a catheter was introduced and about 30 c.c. of urine obtained. This was yellow, with a pinkish tint; showed a marked turbidity with rapidly falling brown granular sediment. Albumin was present to the amount of one-tenth the bulk on standing. The sediment was made up of numerous casts, most of them of large size, but a few were narrow and short. All were of brown color. The larger ones were made up of epithelial cells, leucocytes, well-preserved red blood-corpuscles and "shadows," and brown and yellow detritus granules. The small casts were sometimes similarly made up, sometimes smooth and waxy-looking. There were also many free red blood-corpuscles and renal epithelial cells, and oxalate and uric acid crystals. The epithelial cells were brown, but otherwise of normal appearance.

The *autopsy* was made twelve hours after death. The skin was pale and slightly jaundiced. Rigor mortis was marked.

On removing the calvarium, the membranes showed unusual anæmia. The sinuses contained tough gray clots. The brain was anæmic, not œdematous, of firm consistence. The white substance had a faint grayish tint, otherwise there were no macroscopic alterations in the brain or other parts as far as the beginning of the cord. The latter was not removed.

The heart was of normal size, the muscle anæmic, pale yellowish-brown, soft. In both ventricles were firm fibrinous clots of pale grayish color.

The lungs were in the inspiratory position, very anæmic, otherwise of normal appearance.

The spleen was greatly enlarged, weighing 675 grammes. The capsule was smooth in general, but had soft, easily separable adhesions to the peritoneum in the region of the eleventh rib. The tissue was very soft, having the consistence of thick cream. Section was dark red or chocolate colored, Malpighian bodies not distinctly visible.

The kidneys were of normal size, the capsules stripping readily. The cut surface was anæmic, pale grayish-red in the cortex, pale red in the pyramids. The adrenals of normal appearance.

The bladder contained 50 c.c. of urine having the same microscopic and macroscopic and chemical peculiarities as that examined during life.

The stomach was greatly distended and contained two litres of greenish fluid. The mucous membrane was very thick, of dark-gray color, and covered with tough, adherent mucus. In the fundus were a few small ecchymoses.

The upper part of the small intestine showed nothing abnormal, but in the lower part of the ileum the Peyer's patches and solitary nodules were enlarged and dark gray. The colon showed no change.

The liver was slightly enlarged, the surface smooth, dark greenish-gray. Section showed a similar color; the tissue was very anæmic, cloudy, slightly swollen; the acini not distinct. The gall-bladder and ducts showed no abnormality.

The pancreas was anæmic and gray.

The mesenteric glands were enlarged, soft, and œdematous. The fat in the abdomen was remarkable for its gray color. The muscles in general were dry and dark red.

The bone-marrow (vertebræ, sternum, and ribs) was dark red, but anæmic.

Pieces of various organs were placed in absolute alcohol. Fresh preparations of various tissues were examined in normal salt, and in Müller's solution.

The examination of the blood. During life the blood was examined in the ordinary way, by taking a drop from the cleaned finger-tip and examining, at the bedside, with a Zeiss $\frac{1}{12}$ in. oil-immersion lens. The notes made at the time have been controlled recently by the study of cover-glass preparations. The latter were fixed by heat, and stained with Loeffler's methylene-blue, or hematoxylin, and eosin.

October 30, 5 P.M. Blood-drop of normal appearance. Red and white corpuscles in normal proportions. Parasites are present in enormous numbers. Every field (containing sixty to eighty red corpuscles) contains a number, never less than two or three, often as many as twelve, fifteen, or eighteen. In one field of a dry preparation I have found forty. Frequently two parasites, sometimes three, can be seen in one corpuscle. The parasites are from one-quarter to one-third the diameter of a red corpuscle, when at rest, but usually they are in active amœboid motion. Some of them when at rest show a ring or seal-ring form, and contain extremely small, amorphous, brown or yellow pigment grains. Most of the organisms are roundish (not ring-shaped) at rest, appear homogeneous, and contain roundish dark-brown or black pigment masses in or near the centre. In some of the larger organisms, about half the diameter of a red blood-corpuscle, the earliest indication of segmentation can be seen, apparently, in the appearance of radial lines or streaks, or of small, dark areas around the pigment. Very rarely bodies can be seen which seem to represent the earliest stages of the crescents. These are long or oval, with scattered or central pigment grains, have very little motion and a different refraction from the others. In stained preparations small, round, deeply staining areas can often be made out in the organisms. In the fresh blood there were very few free parasites, and no crescents or flagellate bodies. There are a few polynuclear leucocytes with pigment, either in fine grains or larger, roundish, darker masses.

31st. 12 M. Blood dark-red. The red corpuscles are often irregular in outline or look as if broken, but without a tendency to crenation. The leucocytes are relatively slightly increased. Parasites numerous.

They are smaller than at the last examination, with no pigment, or very few small yellowish-brown granules. Pigmented leucocytes are more numerous than before.

5 P.M. The parasites are in the same stage as at this time yesterday, but are even more numerous. During the examination marked leucocytosis suddenly appeared, the proportion of white to red corpuscles being one to five.

A count of leucocytes shows the following proportion: large lymphocytes, 20 per cent.; small lymphocytes, 12.5 per cent.; large polynuclear, 22 per cent.; small polynuclear, 40 per cent.; transition and large mononuclear, 5 per cent.; eosinophile, less than 0.2 per cent.

It is necessary to explain that by the term "large polynuclear," I include not only the larger forms of that class, such as are found in healthy blood, but also large cells like the phagocytes in Figs. 1 and 2,

FIG. 1.

FIG. 2.



FIGS. 1 AND 2.—Blood from the finger-tip fifteen minutes before death. Phagocytes with parasites in the stage just before segmentation, and pigment from fully segmented organisms. In the upper part of Fig. 2 is a phagocyte containing spores and a pigment-ball. Hematoxylin and eosin. Apochromatic obj. 3 mm., oc. 4. $\times 720$.

the nuclei of which are usually simple but of irregular outline. Many of these cells, especially those with pigment, had in fresh blood a peculiar, hyaline appearance; sometimes their bodies were evidently broken down.

Actual mitotic figures cannot be found in the leucocytes, but there are numerous cells having nuclei suggesting division, probably amitotic. (See the smaller cell in Fig. 1.)

An attempt to count the corpuscles was not successful. The blood was very dark and rather thick. With the Thoma-Zeiss instrument I counted, in several attempts, about 6,000,000 red corpuscles per c.mm., with variable proportions of leucocytes.

About this time nucleated red corpuscles appeared in the blood, but were only discovered in the stained preparations. They are all normoblasts with deeply staining nuclei, and are present in the proportion of about one to a thousand red corpuscles.

From five o'clock until eight the blood was examined continuously, and it was possible to follow the development of the parasites during

that time. They became larger and less active, reaching finally a diameter equal to or slightly greater than half that of a red corpuscle. During the later phases the pigment became more and more closely aggregated, forming a roundish mass in or near the centre of the parasite. This stage can be seen in Figs. 1 and 2, taken from a preparation made at 8 P.M. In a preliminary report on this case (*Medical News*, May 30, June 6, 1891), I said that segmentation forms were not to be found in the peripheral blood. More extensive examinations have shown me that this is not so. In a dried preparation of finger blood taken just before death, stained with hæmatoxylin, I find five sporulation forms with central pigment free in the plasma, and four enclosed in phagocytes. (In Fig. 2, in the leucocyte at the upper part of the field, there is a group of spore-like bodies with a pigment-ball near by. This I have not counted as one of the four, all of which were more perfect.)

EXAMINATION OF THE TISSUES.—The alcohol hardening gave very good results in preserving the parasites. With suitable stains the organisms can be demonstrated with a clearness which leaves nothing to be desired. In order to show the relations of the parasite to the red blood-corpuscles sublimate fixation would no doubt have offered advantages; but for the parasites and the other tissues, alcohol can be recommended.

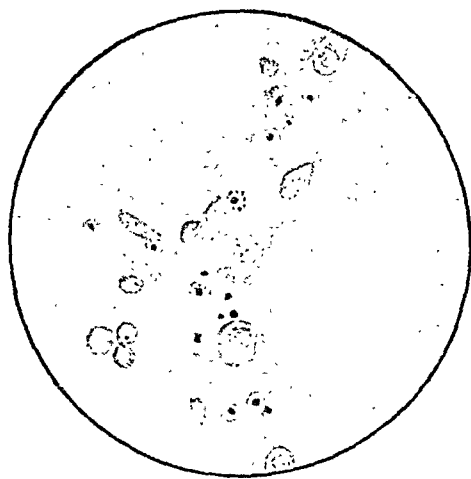
In staining, all kinds of nuclear dyes give good results. Alum-carmin stains the segmenting bodies and fully developed spores very well, and is useful in showing the relation of the pigment to the tissues. Hæmatoxylin, alone or with eosin as a contrast stain, I found on the whole most satisfactory. Methylene-blue gave good results in recently hardened tissues, but was not quite so useful in staining material long in alcohol. Figs. 3 and 4 show methylene-blue stains. Loeffler's solution was used, the sections remaining in it several hours and being rapidly washed in absolute alcohol and cleared in cedar oil. Safranin, fuchsin, and other aniline dyes did not give such good results as those mentioned.

In the following description I have limited myself, as far as possible, to the most important changes, leaving out many details, but omitting nothing essential.

Brain. In the brain the findings vary in different parts, as is usual in malaria. Immediately after the autopsy I examined the smaller vessels in the brain by pulling them out, with the membranes and plexuses, and examining by various powers. In this way it was easy to find the parasites, lying in rows or masses in the vessels. I paid special attention to the condition of the vessel walls and the possible presence of obstructions. But although I examined hundreds of vessels, evidence of thrombosis was scanty. Once I found a mass of parasites and leucocytes obstructing a small artery at its bifurcation. On the whole, the arterial and capillary walls were of normal appearance. In hardened sections the most important alterations are found in the cortex, where the smaller

vessels are frequently full of, sometimes distended by, infected blood-corpuscles as shown in Fig. 3. (It must be remembered that only one plane is shown in the photograph; the capillary contains many times more than those which appear.) The smaller vessels in the cortex often show an excess of leucocytes, and in some of them there are thrombi containing parasites. The changes just described, though marked in some parts, do not appear on the whole to be so extensive as in some other reported cases. In the white substance the changes described are very uncommon. The larger veins are frequently distended with blood, though usually with few parasites. Thrombi are frequent, though rarely causing total obstruction. Many of the leucocytes in various parts of the brain contain pigment, sometimes parasites. The endothelial cells often contain minute glistening globules resembling hæmoglobin, and in the fresh preparations free globules of that kind were very

FIG. 3.



Capillary from brain cortex (3d left frontal convolution). Each pigment-ball is in the segmented body of a parasite, but the organisms do not show distinctly. Methylene-blue. $\times 720$.

common, though probably partly of post-mortem formation. In the central ganglia, the crura, pons, and medulla, the smaller vessels are empty; the larger veins show unusual fulness, but parasites are much less frequent than in the cortex. The upper part of the cord is anæmic, but a few infected red corpuscles can be found. The parasites in the brain are in the later stages, either in the fully segmented form or the spores lying loosely together. The brain and the cord, so far as examined, show no perceptible alterations of the tissue elements (alcohol hardening?).

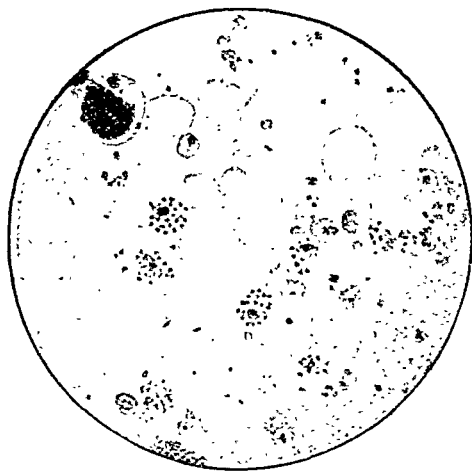
Heart. The muscle fibres show marked fragmentation, the transverse striation is well preserved; the nuclei of the muscles are frequently swollen. In the small arteries and capillaries are moderate numbers of parasites and of pigmented leucocytes. There is an increased proportion of leucocytes in the vessels, especially in the capillaries.

The clots from the ventricles consist of fibrin masses and leucocytes, with few red corpuscles. The large mononuclear leucocytes, or large lymphocytes, which are hard to distinguish in blood hardened *en masse*,

are increased. There are also many large leucocytes with irregular nuclei, containing pigment grains and larger masses. The red corpuscles in the clots rarely contain parasites. Pigment and parasites are present in about the same proportions in clots from right and left ventricle, the proportions varying in different parts of the same clot.

Spleen. In scrapings of the spleen examined after the autopsy, parasites were found in enormous quantities, as shown by Fig. 4, from a cover glass preparation. The parasites were for the most part in the later stages, but in some places, in cover-glass preparations, small bodies can be seen, apparently in the red blood-corpuscles, which from their size and appearance seem to be bodies in the earliest stage of endoglobular existence. In fresh or cover-glass preparations the conditions

FIG. 4.



Splenic juice twelve hours post-mortem. Complete segmentation, and also several parasites in earlier stages, but with pigment massed in one ball. In sections the spores are never so numerous, being usually from ten to fifteen, whereas smear preparations show twenty or more. It would appear from this that division takes place in more than one plane. Methylene-blue $\times 720$.

as to pigment and other peculiarities are so much like those in the hardened tissue that a description can be omitted. Sections of the spleen show moderate hyperplasia of the lymphoid tissue with an intense hyperæmia which separates widely the elements of the pulp. Everywhere in the parenchyma, but varying in different parts, are enormous numbers of parasites. In some places every blood corpuscle contains one. They are almost all in the later stages. In consequence of the hardening, no doubt, the smallest forms, as found in the splenic blood and already described, do not show so well as in the cover-glass preparations. In the lymphoid tissue parasites occur at times in the capillaries. Here, too, are occasional pigmented leucocytes, but pigment grains are never to be seen in the lymphoid cells. Everywhere in the pulp there are large cells with relatively small nuclei. The bodies of the cells are irregular in outline, their nuclei rarely round, but usually bean-shaped, crescentic, or triangular. The cells always contain bodies of the following kinds, in varying number and proportion :

1. Pigment in fine yellowish-brown grains, or in larger darker balls, like those in ripe parasites. Sometimes numbers of these balls can be seen apparently fused together. 2. Parasites with round bodies and central pigment, or segmented bodies. Sometimes the parasites can be recognized as being in the remains of red blood corpuscles, sometimes not. In either case the parasites may be in a round clear area in the body of the phagocyte. 3. Leucocytes, with or without pigment. These are not uncommon, and sometimes one or two small or large lymphocytes can be seen in a large phagocyte. 4. Yellow, very minute globules resembling hæmoglobin. The number of enclosed bodies in these cells is sometimes almost incredible. It is not unusual to find as many as thirty of the large pigment-balls in one cell. Frequently they are so fused together as to make counting impossible. As many as twenty parasites may be seen in one phagocyte. The large splenic veins contain numerous pigmented leucocytes, and also many parasites, both in the red blood-corpuscles and free, as fully developed sporulating forms.

Lymph glands. The enlarged mesenteric lymph glands are hyperplastic and slightly hyperæmic. The capillaries contain pigmented leucocytes, rarely parasites.

The bone-marrow examined fresh contained many mature parasites and sporulation forms, either free or in leucocytes having the characteristics of macrophages. In the bone-marrow were unusually large numbers of the hyaline leucocytes already described.

Liver. The liver shows important changes of various kinds. There is a moderate degree of necrosis of the liver cells, shown by failure on the part of the nuclei to take stains, and a ragged and broken-down appearance of the protoplasm. In some areas without necrosis the nuclei are swollen. In a few places the protoplasm of the liver cells stains deeply with nuclear dyes and has an opaque appearance, resembling minute areas of coagulation necrosis. The necrotic areas are not symmetrical, nor have they any special localization, but are scattered over the acini. The portal connective tissue contains large numbers of small cells in its whole extent, most marked along the vessels of small or medium calibre. The cells are mostly round, of medium size, with round nuclei and narrow rim of protoplasm. A few are larger, with paler nuclei. These collections do not extend into the acini, but are sharply circumscribed laterally, though sometimes of great length.

All the intra-acinous capillaries contain pigment granules, which are so numerous as to simulate an injection when seen by low amplification. Examined more closely, one can see that the pigment is partly free in the plasma, partly in endoglobular parasites, and partly in leucocytes. The hepatic veins and portal veins frequently but not uniformly contain blood with parasites and pigmented leucocytes. The branches of the hepatic artery, when they contain blood, sometimes show pigmented leucocytes, but rarely parasites. The liver cells never contain pigment like that in the parasites. Almost everywhere, but especially in the portal zones, the cells contain numerous small yellow granules, with a more greenish tint than the usual liver pigment, which also occurs sparingly in the cells. Similar granules can also be found in the endothelial cells.

Kidneys. The capsules of Bowman are unchanged, but the capillaries of the glomeruli show loss of epithelium in some places, in others increase of nuclei. In various parts of the cortex there are small, ill-defined collections of small cells, usually near small bloodvessels. In

various parts of the labyrinths the epithelial cells do not take nuclear stains; their protoplasm is granular, or sometimes greatly swollen or broken down, and the lumen of the tubules filled with granular material. In the pyramids, especially in the larger tubules, there is a remarkable desquamation of the epithelial cells. The lumina of the stripped tubules contain isolated epithelial cells, or large casts made of cubical cells, yellowish-brown detritus granules, leucocytes, and red blood-corpuscles. In the casts the cells stain well. The large bloodvessels are empty. The glomerulus capillaries contain parasites in moderate numbers, the capillaries of the labyrinths very few. In the pyramidal vessels, on the contrary, there are large numbers of the organisms, reminding one of the capillaries in the brain cortex or liver. Pigmented leucocytes occur in these vessels in moderate numbers. In the renal epithelial cells the characteristic malarial pigment does not occur, and in the glomeruli the pigment appears not to be in the cells. Many tubules in the pyramids contain greenish-yellow granules, like those described in other organs, and similar granules can occasionally be seen in the endothelial cells of the bloodvessels.

The right supra-renal body contains, in a large vein in the medulla, a thrombus having a structure like those in other organs.

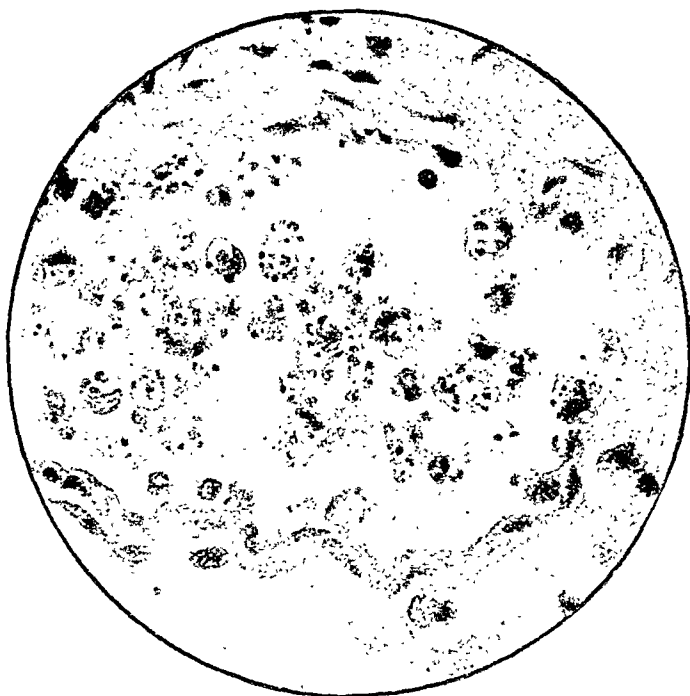
Stomach. The bloodvessels of the submucosa are all distended with blood which often presents increase of leucocytes. A large vein contains a thrombus, almost filling the lumen, made up of leucocytes and an unusually large amount of fibrin. In the mucosa there is marked small cell infiltration between the tubules, and in the submucosa there is an infiltration along the small vessels. The intertubular capillaries contain large numbers of parasites and pigment masses. Very often there is complete filling of several adjacent capillary meshworks. Most of the pigment shows no trace of parasite (probably the effect of post-mortem maceration). In the large vessels, and in the thrombus, the conditions as to parasites, pigment, and phagocytes are as in other similarly affected parts. In a large vein I found one cell resembling a large splenic phagocyte, with several enclosures. It was in the middle of the lumen of the vein.

The slate colored parts of the intestine show conditions like those in the stomach. The pigment showed especially well in teased fresh bits, where the capillary network in the villi was perfectly marked out by pigment.

Pancreas. The pancreas contained a few parasites in the capillaries, but no other changes of note. In examining that organ, however, I was struck by the large quantity of pigment in the loose fat around it, and was led in that way to examine the abdominal fat as far as possible. Besides the fat around the pancreas, I had preserved a good deal adherent to the adrenals and the stomach. Everywhere in this tissue I find the same peculiarities. In the first place there is an unusual fulness of the bloodvessels, resembling that in the bodies of persons dying of valvular lesions of long standing. There were, besides, interstitial hemorrhages. In all the blood in these parts, including the hemorrhages, there are quantities of parasites such as are found nowhere else except in the spleen. Every cross section of a capillary shows one or more parasites, and where the capillaries are cut lengthwise every one of the closely packed blood corpuscles can be seen to contain an organism. In the smaller veins the numbers are enormous, but in the larger veins the

blood appears quite normal. Many of them are in the later stages, as in the other organs, but often small bodies can be seen in the red blood-corpuscles, taking a faint stain and containing very minute pigment grains, which appear to be bodies in an early period of development. In the larger veins are large numbers of leucocytes, and often thrombi, made up of leucocytes in a coarse fibrin network. The leucocytes contain pigment and parasites (see Fig. 5). They are large polymorph-nuclear cells, with comparatively small nuclei, usually near the edge. They are not so large as the macrophages in the spleen. The parasites

FIG. 5.



Vein in abdominal fat, showing the phagocytes. In many leucocytes the bodies of organisms can be seen lying in vacuoles. In one parasite segmentation can be seen to have begun. There are many parasites in free red blood-corpuscles and in the plasma, some of which are segmented, but these do not show distinctly in the photograph. Hæmatoxylin. Apochromatic obj. 3 mm., oc. 4. $\times 640$.

often lie in clear spaces in the protoplasm of the cells. The organisms in the phagocytes are all in the later stages of development, including that of separation of the spores. The latter cannot be recognized in the figure, but one parasite completely segmented can be recognized. The leucocytes do not exhibit a marked tendency to approach the walls of the vessels. The figure shows the nearest approach to that I could find, but neither here nor elsewhere is there evidence of phagocytism on the part of the endothelial cells.

CLASSIFICATION OF THE PARASITES IN THIS CASE.—As I have stated in my former communication, the parasites encountered in this case seem to be identical with those described by Marchiafava and Celli

and their pupils as the small plasmodium,¹ or the parasite of summer and autumn in Rome, and to which more specific names have been given by other writers. They agree, so far as one can determine by descriptions and without actual comparison, in the size of the fully-developed organism, their short cycle (about twenty-four hours), their lively motion, and the peculiarities of the spore figure and of the pigment (see Fig. 4).

THE PARASITES BEFORE AND AFTER DEATH.—In this case I hoped to be able to get some light on the question of the development of the organisms in the dead body. During the last hours many of the organisms were in the latest stages—that is, there were round bodies with central pigment, and segmented bodies. Had these continued their development they should all have disappeared within a few hours. Besides these there were many small bodies, almost uniform in size, and either entirely without pigment or containing only one or two of the finest grains. As the autopsy was made just twelve hours after death, it was to be expected that if further development had taken place only the half-grown parasites would be found—that is, small ones with scattered pigment grains. This, however, was not so. In blood from different organs examined at the autopsy, and in cover-glass preparations and hardened tissue, there are enormous numbers of sporulation figures and a few unsegmented but, judging from their size and pigment, almost ripe organisms (see Fig. 4). In splenic and in peripheral blood there are very small bodies, slightly larger than spores, apparently in the red blood-corpuscles. These are most probably the earliest intracellular forms. In one place only, in the red blood-corpuscles in the abdominal fat, are there small pale bodies (stained preparations) containing minute pigment grains. There seem to be plasmodia slightly more advanced in development than the spore-like ones in the spleen, and correspond approximately to what one would expect to find at that time in the finger blood had the process continued.

It seems, then, that the growth of the parasites was checked almost completely very soon after the patient's death. Whether this was due to lack of oxygen or to altered temperature, or to other causes, we can only conjecture.

REMARKS.—When we endeavor to trace the relation of the infecting organisms on the one hand to the clinical phenomena and anatomical changes as found post-mortem on the other, we find, even in a comparatively simple case like the foregoing, many difficulties. It is worth while to consider some of the possible sequences of cause and effect.

¹ The use of the term plasmodium as the generic one for this organism is so much greater than that of all proposed substitutes taken together, that objections seem useless. The fact that the word is used as a technical term in biology can hardly lead to confusion, unless perhaps in the very beginning of investigations in the literature of malaria.

As the most direct result of the action of the parasites, we must consider a destruction of red blood-corpuscles and a corresponding anæmia (oligocythæmia). It is easy to understand the mode of production of this when we remember that the development of each parasite involves the destruction of a red blood-corpuscle. The extent of the destruction must vary widely in different cases, in many mild tertians being less than one per thousand in forty-eight hours, in some quartans even less. In a case like the one now reported, blood-counts are unreliable. I explained the high count in this case (6,000,000 per c.mm.)—which was paralleled in another case of malarial remittent, with a temperature of 106.2° F.—by a concentration of the blood mass, which, in view of the continued high temperature, the rapid breathing, the continual vomiting, and failure of absorption of water swallowed, is not difficult to understand. For reasons equally clear, estimations of the hæmoglobin in the acute stages of malaria have a possible source of error. The most plausible explanation of the blood after malarial attacks is that it is in a condition similar to that in post-hemorrhagic anæmia, with reduction of the number of red corpuscles and hæmoglobin in equal proportions, and during recovery the count increasing more rapidly than the hæmoglobin, with nucleated red corpuscles appearing. The early appearance of the nucleated red corpuscles is shown in my own case.

An accurate estimation of the proportion of parasites to corpuscles could not be made in my case. In finger blood, proportions of one to five or six were not uncommon, and sometimes the proportion was even greater. But in other preparations there were smaller numbers of parasites. In many internal organs, however, the relative numbers of parasites must have been very great. It is probably safe to assume that in the last day there was a proportion throughout the blood as a whole of not less than one to five, involving the destruction of that proportion of red corpuscles in twenty-four hours. This is not incredible, for other observers (Mannaberg, *Die Malaria-Parasiten*, p. 154) have reported cases in which the proportion could not have been less.

Such a proportion indicates an enormous power of development on the part of the organisms. It is not enough to assume that a large number of parasites have been taken in, which has sometimes been supposed to be the cause of pernicious attacks. It is known that in ordinary cases of malaria destruction of a part of each new generation of parasites takes place. In a case in which this is not great, or is absent, the natural increase of the bodies would soon produce a number equal to that in even so severe a case as the one now reported.

The peculiar conditions leading to unusual development of the spores may have some connection with the greater resistance to quinine present in such cases.

Clinically, the anæmia in my own case may be said to have been

expressed in the dyspnœa (which also probably had other causes) and the thirst. In another case of pernicious malaria I had a striking example of the latter symptom. The case was one of algid pernicious, with a temperature of 95° to 97° F., in which the patient begged piteously for water. This has been supposed to indicate an internal high temperature. Asking the man, whose mind was perfectly clear, if he had fever, he said "No, but I am so dry." In a few hours he was dead, asking for water (which he got, and could swallow and absorb) to the last; but the temperature in internal organs, half an hour after death, was only 98° F.

But anæmia does not explain all the clinical phenomena of this or any other case of acute malaria. In my own case there are lesions in abundance, but it is not easy to ascribe to each one its part in the production of the symptoms or the relation of the parasites to the lesions.

There is a probable effect of the parasites aside from the anæmia which we must consider, namely, the formation of toxic substances. In the growth of the parasites and in the digestion of the red blood-corpuscles it can hardly be doubted that toxic substances are produced. What these are or how they act we cannot say. It is reasonable to suppose that the characteristic phenomena of the paroxysms are largely due to the action of the hypothetical poisons on the nervous system. It might be urged that this theory of the paroxysms, which is of course not new, is weakened by the fact that in the more severe malarial infections some of the phenomena are not so strikingly exhibited as in mild cases. It is to be remembered, however, that in the severe infections substances may be formed in unusual quantities which have an inhibitive action on certain phenomena of the paroxysms. Moreover, it cannot be doubted that temporary or permanent disposition has much to do with the clinical features of malarial paroxysms.

The most important factor, however, in the causation of the atypical attacks of malaria is perhaps the inflammation which is so marked in certain organs. It is not difficult to see how the difference between an intermittent and a remittent, or even continued fever, might depend on the existence in the one case of a gastritis or hepatitis.

The possibility of an action of toxic substances on the nervous system cannot profitably be considered in connection with my own case. The method of hardening employed makes it impossible to say positively that there were no degenerations of the nervous tissue. Some nervous symptoms, like delirium, were not so marked in this case as often happens in pernicious malaria, even in less severe cases, but the possibility of toxic substances acting on the centres of the medulla must not be forgotten, the more so as we cannot find vascular changes to account for the dyspnœa and other symptoms (respiratory death?) which might have been wholly or in part of medullary origin.

The necrotic alterations in certain other organs can hardly be looked upon as anything but the results of toxic substances. I refer especially to those in the liver and kidney. The alterations in the stomach were probably also originally toxic, but in the case of this organ other influences may have assisted. The other changes in these organs, vascular fulness, small-cell infiltration, etc., would seem to have been partly reactive, due to the necrosis, though they might also be ascribed with some reason to the same causes as those which produced necrosis.

Some peculiarities of the parenchymatous lesions deserve emphasizing. In the liver the areas of interstitial inflammation and necrosis do not coincide. The infiltration does not seem to involve, therefore, a preceding necrosis. It is noteworthy that judging from the forms of cells there is no tendency to suppuration.

But while this one case, in which other possible causes seem absent, shows that malaria can give rise to interstitial hepatitis, examinations in other cases indicate that the process does not always occur. In the liver from the case of *algid* pernicious there are small areas of necrosis, but no infiltration. In a case with death from ruptured spleen there is neither necrosis nor infiltration in the liver.

While the alterations in the cortex of the kidney seem toxic, the changes in the tubules of the pyramids are so different that it may be questioned whether they are not due to local circulatory disturbances, especially in view of the condition of the blood in the capillaries of those parts. No matter how caused, the desquamation gives a simple explanation of the hæmaturia, an explanation which of course cannot be applied to other cases without confirmatory observations.

The parenchymatous changes in the stomach and the similar but less severe alterations in the intestines, as is well known, do not occur to the same extent in all cases. In the *algid* case mentioned before there was marked chronic gastritis, but no recent change. It may well be that the anæmia accompanying the chronic disease had some influence on the process.

It is difficult to estimate the precise anatomical and clinical importance of thrombosis, which occurred most frequently in the brain cortex. In the latter it is not so marked as it has been apparently in some other reported cases. Though it probably had some connection with some of the nervous symptoms observed, it does not seem, from its localization, as if it could have had any bearing on the more important symptoms, especially the dyspnœa, the temperature, or the pulse.

Certain phenomena of malaria are due probably to the peculiarities of the localization of the organisms. This, from the little we know of the subject, certainly varies in different cases. In my case it was most marked in the spleen, liver, brain, and kidney, and last, but not least, in the abdominal fat. The localization of the malarial parasites, like that

of other blood parasites, is opposed to our ordinary ideas of the circulation, but the fact is more remarkable in malaria in that the parasites are for the most part within the passive red blood-corpuscles. That blood parasites in general tend to accumulate in parts where the circulation is slow is well known, and that infected or diseased red blood-corpuscles tend to accumulate in certain organs with slow circulation, like the liver and spleen, is also known, but these facts do not explain the whole matter. In the case of the abdominal fat the hyperæmia would offer favorable conditions for stagnation, but the cause of the hyperæmia cannot be easily explained. It is, perhaps, necessary to say that the abdominal congestion was not due to chill, as there was none. Still less could it be of post-mortem origin.

Another fact which seems to have some connection with the peculiar localization of the parasites is the remarkable distribution of the leucocytes. The proportions of the various forms of leucocytes indicate that there was an unusual production of those cells, which may be explained by an irritation of lymphoid tissues, but owing to the irregular distribution, efforts to count them were even less successful than in the case of the red corpuscles. They are present in greatly increased proportion in the capillaries, and often, but not always, where parasites are especially numerous. They are also present in remarkable numbers throughout the congested abdominal fat, as shown by Fig. 5.

The latter facts might be interpreted as indicating that the leucocytes go where there are the greatest numbers of parasites. But many of the increased number of leucocytes in those places are cells that do not act as phagocytes, so that it seems more rational to assume that local conditions of the circulation, leading to stasis, are the important factors in the accumulation of both parasites and white corpuscles.

PHAGOCYTES AND PHAGOCYTOSIS.—In this case the enclosure of parasites is extraordinarily frequent, as a reference to Fig. 5 will show. In blood taken from the finger at 8 P.M., 10 per cent. of the leucocytes are phagocytes, there being large and small polynuclear cells in the relative proportions of 6 and 4 per cent. In the finger blood the phagocytes seem to be leucocytes such as occur normally in blood. In the liver, the spleen, and bone-marrow there are larger cells. The most remarkable are those which occur in such large numbers in the spleen. They are similar to, but usually larger than the large cells found in the spleen in other infectious diseases, especially typhoid fever and certain cases of pyæmia. The origin of these cells is obscure. From their appearance an endothelial origin might be supposed, but nowhere in my own case is there evidence of such an origin. Notwithstanding most careful search I can find no sign of phagocytosis in endothelial cells *in*

situ, which is claimed by Metchnikoff¹ and his pupils as being common in many conditions, including malaria. There is also no swelling and no apparent desquamation of endothelial cells. In G. P., I cannot find pigment in the liver outside of the vessels, but in cases of longer duration I find it occasionally in the cells of Kupffer, claimed as of endothelial origin by Metchnikoff,² but not even in those cases in the endothelial cells in the inner surfaces of the vessels. This question is discussed from another point of view later.

In regard to the enclosures of the phagocytes, the commonest is pigment, especially pigment of the form which is present when the parasites undergo segmentation. Next in frequency are parasites. These are in the later stages, especially the stage of segmentation. It seems to me, though the point is a difficult one to decide, that the bodies in the phagocytes, on the whole, are in an earlier stage of development than those not enclosed. This may be due to the fact that those free in the blood continued to develop after the others were swallowed. But as parasites when swallowed in an active condition continue to show signs of life for some time, as many observers have noticed, it seems more likely that the enclosed parasites in my case were dead or dying when swallowed. In other words, I think that the work of the phagocytes in such cases is not essentially different in its objects and method from that exhibited in regard to any inert foreign material in the vessels. Certainly if phagocytism were directed to plasmodia alive and active, we could never have such a large number of parasites in the blood as occurred in this case, for in the beginning even the circulatory phagocytes must be present in greater number than the parasites, while the endothelial cells also have good opportunities for acting on them. Once the parasites are paralyzed or killed, either by drugs given for the purpose or by something formed in the body, there would be nothing left for certain cells to do but enclose them for further disposition.

THE MALARIAL PIGMENT.—Since the excellent work of Arnstein,³ we have known that the malarial pigment originates in the red blood-corpuscles, and so might contain iron, but at present we do not know whether it really does contain iron, although various writers make positive statements pro and contra. For years, on account of its color, malarial pigment has been called melanin. But as the real nature of various other so-called melauins has been made known, there is a tendency on the part of chemists to restrict the use of the word to certain pigments of known composition, and probably different from malarial pigment, though pathologists have not shown a tendency to observe the distinction. Nothing short of an ultimate analysis will enable us to properly classify or name the malarial pigment; and such an analysis,

¹ *Leçons sur la Pathologie comparée de l'Inflammation.*

² *Loc. cit.*, p. 163 et seq.

³ *Virchow's Archiv*, 1874, Bd. lxi.

with suitable material, should not offer insuperable obstacles. The micro-chemical tests so far available cannot decide as to the presence or absence of iron, as the results of various observers ought to show. Knowing the impossibility of settling the question, but hoping to arrive at some explanation of the contradictory statements of others, I made an extensive series of examinations, and feel that the results are worth recording.

In order to test various methods, I used the liver and kidney of a case of pernicious anæmia from the collection of the Leipzig Pathological Institute. All the specimens had been hardened in strong alcohol. They were cut in paraffin and fixed on cover-glasses by heat. They came in contact with iron only in the process of cutting.

I began with ammonium sulphide, but had to give it up as unsuitable. It gave the iron reaction in certain of the yellow globular particles resembling hæmoglobin, in the vessel walls, and in the large phagocytes of the spleen. It slowly dissolved the malarial pigment, decolorizing a section completely in from twenty minutes to an hour. Afterward there was a black amorphous precipitate, due probably to the evaporation of the reagent. The solubility of the pigment in ammonium sulphide had been observed before.¹ Evidently with a reagent so powerful as ammonium sulphide but little could be expected, and after determining the facts mentioned I took up the Berlin and Turnbull's blue tests. In using these I found after trying various methods that the modification used by M. B. Schmidt² gave the best results. It is as follows: A two per cent. solution of potassium ferrocyanide is poured in a dish and pure hydrochloric acid added in the proportion of one per cent. The sections are placed in this, and in case the reaction is positive soon become more or less blue. It is advisable to follow the reaction under the microscope with a low-power objective. After the maximum intensity of color is obtained the section should be washed in distilled water and can then be mounted or can be stained and then mounted. For staining I use lithion carmine, though, of course, any contrasting stain could be used. If the staining be done first, as is sometimes recommended, no matter how carefully the solutions are filtered, a number of minute cotton fibres and more or less granular material will adhere to the sections and give the iron test, which is extremely delicate.

The pigment in the parasites, including the finest grains, never gives the blue reaction. The same is true of free pigment, or pigment in phagocytes which can be recognized as of parasitic origin. This, of course, does not prove that iron is not present, but only that it is not present in a form which responds to the test.³ But in the course of the observa-

¹ Kiener: Cited by Mannaberg, *Die Malaria-Parasiten*, p. 26.

² Virchow's Archiv, Bd. cxv. p. 402, note.

³ See the excellent remarks of E. Neumann on this subject, Virchow's Archiv, Bd. cxvi p. 318.

tions I obtained results which may go to explain the statement of some, that the pigment gives the iron test. The yellowish globules already mentioned all give the Berlin-blue reaction distinctly, but in different degrees of intensity. They occur in almost all organs, though in most places sparingly. They can be found in the endothelial cells of the vessels, sometimes in the vessels, among the blood corpuscles. In the kidneys they are present also in the epithelial cells, but here not all the yellow particles, even in the same cells, give the reaction. In the spleen there is a diffuse blue stain from fine particles which give the test. In the macrophages, among the other enclosures, fine blue particles appear. The liver shows three kinds of pigment: the malarial pigment, the orange-yellow pigment, common in that organ, and yellow granules similar to those in other organs. Of the three, only the latter give the blue reaction. In my case these granules are present in great number, being almost as numerous as in the case of pernicious anaemia. In the case of rupture of the spleen there are almost as many, but in the algid case there are comparatively few. The casts in the renal tubules do not give the reaction at all, a result which surprised me, but which was very thoroughly controlled. (In these casts there was no malarial pigment.)

There is, then, in malaria an unusual deposit in certain organs of a material which gives an iron reaction, though the malarial pigment proper does not do so. There is a very simple explanation of the origin of this material, which has occurred to others. The explanation is as follows: The true malarial pigment is an excrementitious substance formed by the digestion of the red blood-corpuscles. In the development of the parasite the corpuscle infected is not always completely digested, but a narrow ring or part of a ring is left. Even in the case of the larger parasites of tertian or quartan fever, which, when full-grown, are as large as or larger than a red corpuscle, complete digestion of the red cells does not always occur. In the case of the smaller parasites of pernicious fever a comparatively large part of the red corpuscles must be left over after the development of the relatively small organism. But the relics of the affected cells must be unable to carry on the ordinary functions of blood corpuscles. Evidently they must follow the course of worn out red corpuscles, and some of their constituents be used over again or excreted. For the former purpose they will be taken up by various cells, especially by cells in the spleen, the liver, and the bone-marrow. According to this view, the iron-reacting granules in the various cells are derived from the *débris* described, the *hæmoglobin* having been so altered as to give the iron reaction. It is interesting to see that this storing-up takes place to a greater extent in some organs and some cells than others, just as occurs under ordinary circumstances, and in my cases is most marked in the great "magnet" of Kobert, the liver. Part of the *hæmoglobin* may also be excreted by the kidneys,

In my cases this seems to have been slight, and the results of the iron tests in the kidneys were so different from those of Stieda¹ that it would seem that storing-up and excretion vary in different cases.

There are some other possibilities which may be mentioned. One is that the iron-reacting granules are derived from the malarial pigment, which has been altered by the cells containing it. Against this view is the fact that in those cells in which the blue granules are most numerous the ordinary non-reacting pigment cannot be found. The malarial pigment must ultimately be worked up in some way, or eliminated, because in examinations of old cases of malaria there is much less pigment than one would expect to find; but even in these cases the unmistakable pigment left in the connective tissue gives no iron reaction.

Another possibility which may be suggested is that part of the dark pigment occurring in the leucocytes has been formed there out of hæmoglobin remnants. There is no evidence of this, however, and the malarial pigment, from all we know about it, seems to differ from all the other pigments formed by or from the blood.

SYPHILIS OF THE EPIDIDYMISS.

BY CHARLES W. ALLEN, M.D.,
SURGEON TO THE CITY HOSPITAL, ETC., NEW YORK.

DURING my term of service at the City Hospital, just drawing to a close, it has been my fortune to treat several men whose histories are not without interest, and in relating them in connection with some previous observations, I will take occasion to speak of those conditions of the epididymis in syphilitics, which are too commonly passed over with the comprehensive diagnosis "Syphilitic testicle." There are, as is well known, instances in both early and late syphilis, in which the epididymis is alone involved, while the globe of the testis remains free, but too little attention has been paid to them, and they are usually passed over in the text-books with either slight comment or are wholly neglected. I do not wish the not infrequent combination orchiepididymitis to enter into this discussion, nor will I dwell upon those instances in which both globe and epididymis are coincidentally affected, and the epididymis is simply indurated and enlarged after the testis has softened and regained its normal condition.

In support of my proposition that authors have comparatively little to say about the epididymis as an independent seat of specific involvement, I quote from several different sources the following sentences:

¹ Centralblatt f. allg. Path. u. path. Anat., 1893, p. 321.

"In the later stages of syphilis the epididymis is affected only when the testicle itself is diseased." "The epididymis may suffer with the testicle." "The earlier syphilis attacks the testicle the more liable is the epididymis to suffer." "An isolated affection of the epididymis alone does not occur." "The epididymis is a common seat of tubercular disease, but a very exceptional one for syphilis at so late a date." The more recent special works on syphilis devote more or less space to the subject, but regarding it as among the least discussed questions of syphilis, I have chosen it as one to which a brief consideration may profitably be given. I would, then, propose as a thesis from which such consideration may radiate, that the epididymis is capable of suffering by itself, and not infrequently is affected independent of the testis proper, not only in the early consecutive period of syphilis, but in all stages of the disease and sometimes quite late. This involvement of the epididymis may be of inflammatory nature, with deposit of plastic matter between the tubes, cementing them together into a more or less firm mass; it may take the form of minute gummous deposits disseminated throughout the parenchyma, but more especially in the globus major, giving an irregular and possibly nodular outline to the touch; it may occur as a diffuse gummous infiltration or hyperplasia, occasioning smooth, plate like masses which may become veritable tumors in the scrotal sac; or a condition of sclerosis may result, the epididymis becoming firm and fibrous in much the same way that the tongue suffers in sclerous glossitis after neglected gummous infiltration.

In what is commonly designated syphilitic testicle, the epididymis is co-affected in perhaps one-third of the cases, and the possibility of the latter organ remaining enlarged after a mild grade of orchitis which has disappeared is mentioned again simply to indicate a source of possible error in diagnosis.

If we approach the question from the analogical side we are at once strengthened in the belief not only that syphilis of the epididymis may exist as an independent thing, but that in point of fact it should be a not infrequent manifestation of the syphilitic state. It is more or less generally known that the epididymis may alone become affected in quite a number of diseases capable of infecting in succession or coincidentally various portions of the economy. This we find to be the case at times in mumps, typhus abdominalis, scarlatina, variola, amygdalitis, and some forms of pyogenic microbe poisoning, to say nothing of the various acute and chronic forms of urethral epididymitis of which that caused by blennorrhagic infection takes the very advanced lead. Furthermore, we have accounts, from inter-tropical countries more especially, of forms of malarial poison which expend their force upon the epididymis. Coming back to the poison of syphilis, and observing its effects as modified in the hereditary form, we find as a rare condition an interstitial epididy-

mitis in young children without sign of disease in the globe. While associated with orchitis it is quite common. When the epididymis is alone affected the enlargement is apt to be double-sided, and this we will see to be the case very often in acquired lues. There seems then to be no valid reason for a theoretical exclusion of the epididymis from occasional attack by itself, and I believe the reason it has not more often been observed and recorded is because of the painless nature of the condition which makes it easy to escape observation; the patient often making no complaint, the physician does not have his attention especially directed to it unless there is much enlargement. The early syphilitic epididymitis, whose first description is usually ascribed to Dron, but which Engelstedt seems to have written about two years earlier, in 1861, had almost escaped recorded observation up to this comparatively recent date. Since then little has been added to the literature bearing upon it if we except the brief writings of Szadek.

The term "epididymitis" is applicable here because the process is of inflammatory nature, and still so little pain is occasioned by it that oftentimes no complaint is made. The limits of time for the appearance of this epididymitis have been placed within the third and thirtieth months succeeding the chancre. While I have seen several instances which fell within this period, I feel certain that the identical condition may develop at a much more remote date from the infection.

The following instances of double epididymitis disappearing promptly under anti-syphilitic treatment impressed me as belonging to this variety, though eight and ten years respectively had elapsed since the infecting sore.

CASE I.—T. J. was admitted to City Hospital on December 29, 1891, with the epididymis enlarged upon both sides, the left less indurated than the right, the testes being soft and normal. Patient had contracted syphilis eight years before. No gonorrhœa, no history of phthisis. When I went on duty, January 1st, I found the epididymis on both sides enlarged, slightly tender, and the cord slightly indurated. The globes of the testes were normal to the touch and to patient's sensation. There were no other evidences of syphilis present. Iodide of potassium was given in increasing dose to point of tolerance, patient remaining in bed.

On January 22d patient was discharged cured. The history of this case, as it appears on the hospital book, is, I regret to say, somewhat meagre. It does not necessarily follow that an epididymitis existing in a patient who gives no history of gonorrhœa or other urethral disease, but has a more or less distinct history of syphilitic infection, is for that reason surely specific. But in the following cases the diagnosis of syphilitic epididymitis was apparently confirmed by the prompt and marked improvement under the iodide of potassium and the local use of mercurial ointment.

CASE II.—J. W., aged thirty-one years, was admitted December 11, 1891. There is a history of syphilis acquired ten years ago, and patient

has a syphilitic eruption now upon the skin. There is a history of only one attack of gonorrhœa eight years ago; no gleet. One year ago both testicles swelled up, patient says, and remained so for six weeks. This swelling never seemed to wholly disappear, and has increased off and on, especially after coitus. The present enlargement began three months ago, and has been entirely painless, but produces a sensation of dragging. Examination showed the swelling to be located in the epididymis of both sides, which were elongated and indurated, but not tender. Treatment by increasing doses of iodide of potassium and unguentum hydrargyri over the scrotum succeeded so well that on January 22d patient was discharged at his own request, although a slight amount of enlargement still remained.

Now it is in just such cases as the above that an enlargement of the epididymis may persist for years, and, in the absence of other syphilitic manifestations or history of infection, have its real nature ignored until, possibly as a safeguard before removal of the organ for supposed malignant disease or tuberculosis, a course of the iodides is tried, when, behold! the whole tumor melts away and a brilliant operation is lost.

A slight improvement under the iodides must not, however, have too much weight given to it, for I am convinced that in tuberculosis of the epididymis, as well as in some joint and skin affections, a certain temporary improvement may result from such a course of treatment. Where fibrous changes have taken place we cannot hope for a return to normal form and size; and when pressure has been exerted, surrounding, and perhaps parenchymatous, fibrinous deposits may result; but, aside from such changes, the iodides should effect a perfect cure.

CASE III.—M. E., aged fifty years, a strong, healthy-looking man, was admitted January 14, 1893. Two years ago I had performed a perineal urethrotomy upon him for the relief of a very tight stricture in the deep urethra, which resulted in prompt and complete cure, since which time he had remained well and free from any urethral discharge or symptoms. Patient had had syphilis ten years ago. About two months before coming into the hospital and a week after a slight injury to the right testicle, caused by climbing over a partition between two rooms (the patient assuring me there was no woman on the other side), a swelling was noticed which was tender and painful, necessitating rest in bed for a few days. Examination revealed a scrotal tumor twice the normal size, which was found to be due to enlargement of the epididymis alone, the globus minor being bound down to the connective tissue and skin of the scrotum. The skin over this indurated mass, which showed very little tenderness, gradually became violaceous and finally broke down, discharging a thin watery pus from a small opening, which remained for several weeks as a discharging fistula. The enlargement of the epididymis was found so irregular and nodular, as the scrotal swelling subsided, and was attended with so little discomfort, and entire absence of pain, that tuberculosis of the organ suggested itself at once to the mind, and the subsequent fistulous formation only tended to strengthen this view. However, from the history of the case, it was thought at least possible that it might be an instance of specific epididy-

mitis, the injury received acting simply as an incentive to the development of this local manifestation of the constitutional disease. Protoiodide of mercury was therefore prescribed from the start; but, as mouth symptoms soon appeared, the iodide of potassium was substituted in gradually increasing dose until over a drachm was being given three times daily. This medication appeared beyond doubt to act in causing a speedy cessation of the softening process in the scrotal infiltration and gradual decrease in the discharge as well as in the size of the enlargement of the epididymis. After a time there developed an iodide eruption over the extremities, which took the form of an erythema nodosum, with lesions varying in size from a quarter piece to that of a silver dollar. The iodide was consequently decreased, given in milk, and belladonna ordered. In this way a moderate dosage was maintained until late in March, when the dose was but 30 grains daily. The improvement had been rapid and marked. Now daily hot sitz baths, followed by massage of the epididymis and tissues to which it was connected, were begun and continued until the patient was discharged as cured on April 2d. The fistula had been closed for some time, the epididymis (which showed no longer any infiltration) had regained almost its normal size and contour (the scrotal skin had a healthy appearance), and there only remained a cord-like band extending from the region of the tail of the epididymis into the subcutaneous connective tissue.

In my experience trauma alone occasions no such picture, and in tuberculosis iodide brings about no such radical restoration. The case illustrates that class which resembles tuberculosis, but is not to be confounded with that other pseudo-tuberculosis which follows chronic epididymitis, due to urethral causes. A patient presented by me a year ago at the Academy well illustrated the latter form. Here a cure was effected, mainly by time alone, after the accompanying hydrocele was cured by carbolic injection.

CASE IV.—M. D., an Italian, aged forty years, was admitted January 3, 1893. There was a history of syphilis and secondary manifestations. Some months ago the patient had a hydrocele upon the left side, which was operated upon. Shortly afterward the right side became enlarged, and the patient, making his own diagnosis of the same condition, undertook to be his own doctor, and attempted to make an opening with a pin to let out the water. The operation was not a success, so he applied for treatment. Examination showed the right epididymis greatly enlarged, causing a firm, hard, painless tumor, with no fluid in the tunica vaginalis. Patient was put to bed, with scrotum suspended, and over it mercurial ointment was kept constantly applied, while iodide of potassium was given in increasing doses. On January 12th patient was discharged, greatly improved, and the diagnosis of syphilis of the epididymis seemed to be confirmed by the rapid disappearance of the enlargement under specific treatment.

CASE V.—F. Q., aged forty years, came into the hospital on February 7th, expecting to have his left testicle removed. He had been told by his physician in town that he would have to undergo an operation. My house surgeon said to me, as the dressings were removed at my first visit: "I suppose there is only one thing to do in this case?" He had

already proposed castration, and the patient had consented in case I said it was necessary. The case was one of gumma, involving the scrotum and deeper parts in an extensive slough, and I mention the foregoing circumstances to give an idea of the destructive process which had already taken place, and of the appearances presented by the tumor, which threatened still greater damage.

The history was one of syphilis acquired nine years before, which had been treated for a short time only, and principally with iodide of potassium, for the most part self-prescribed. There had been no active signs of the disease for six or seven years. One year ago the left testicle began to swell, but the swelling was painless, and, as it gave no trouble, nothing was done for it until one month ago, "when the lower portion of the bag seemed to grow fast, and finally turned into a discharging sore." He then went under treatment, but the increase in size of the swelling and extension of the ulceration, he says, led the physician to advise hospital care, as he thought the growth would have to be removed. Examination of the scrotal contents showed the tail of the epididymis enormously enlarged, firm, and distinctly bound down through the connective tissue with the deep sloughing ulcer of decided gummy appearance. The head and body of the organ formed a cartilage-like plate of thickened tissue over two inches in diameter, distinctly separated from the testis, which latter appeared soft and normal to the touch. The adherent mass of slowly suppurating tissue which formed the floor of the ulcer was scraped out with Volkmann's spoon and packed with bichloride gauze. Iodide of potassium was given in daily dose of forty-five grains, gradually increased, so that by February 22d three drachms were being consumed. By March 3d the ulcer had healed under this treatment, combined with local mercurial inunction over more than half its extent, while the epididymis in all parts was decidedly smaller, about a quarter of its original size, but still of cartilaginous hardness.

March 16. The attachments of the external to the deeper parts is much less firm, and the external mass cannot be separated from the enlarged and hard tail of the epididymis. The decrease in the size of the globus minor has been more rapid than in the globus major.

24th. Ulcer about healed, and surrounding infiltration hardness much diminished. Ordered iodide, which has been given for some days in dose of three hundred grains daily, gradually diminished on account of slight iodide eruption on the face. Daily hot sitz bath, followed by the form of massage known as petrissage, or combined kneading and pressure of the organ, with the view of encouraging lymphatic absorption. This was done for twenty minutes, morning and evening, with the result of hastening the retrograde process.

April 14. Testis soft, globus major still appears as firm, smooth tumor, one-sixth the size on admission; ulcer healed. Patient discharged, but advised to continue iodide till all infiltration disappeared.

CASE VI.—H. N., aged thirty-four years, came under my observation on March 1st. He had a history of syphilis, acquired five years ago, and was only treated for three weeks. No gonorrhœa for six or seven years. Patient states that the right testicle swelled up after a cold, contracted a month ago. Had never before had such a swelling, and there was no urethral trouble and no injury. There was no pain attending the enlargement till four days before he came under treatment, when pain was experienced in the groin and back.

Examination showed the epididymis, and especially the globus major, to be enlarged, smooth, hard, but not tender to pressure. The tail is thickened, but the body is not much enlarged. The globe of the testicle appeared soft and but little, if at all, larger than its fellow.

Treatment by local inunction and iodide internally (gr. x), gradually increasing the dose.

March 24. Now twenty grains of iodide three times daily. Epididymis smaller, but still hard and enlarged in all parts. Testicle appears a trifle larger than at first, though soft to the touch. Whole tumor mass much decreased.

Ordered twice daily hot sitz bath and petrissage to whole scrotal contents on this side.

April 7. Remarkable decrease in size of epididymis since latter treatment was added to the iodide, now given in drachm doses.

Patient was discharged for insubordination about April 20th, at which date there were scarcely any remains of the infiltration.

CASE VII.—H. B., aged forty-three years; first seen February 25. Had gonorrhœa for the last time ten years ago, and has had no urethral discharge or disease since. Contracted syphilis ten years ago. Six weeks ago the left testicle began to enlarge gradually, and at first painlessly, but subsequently pain was felt after walking much.

On examination the testis was found large, smooth, firm, non-sensitive to pressure, the epididymis distinctly but not greatly enlarged.

Treatment.—Iodide in increasing dose.

March 10. Patient now taking two drachms daily, and has an iodide eruption over face and backs of hands, resembling the wheals of urticaria. Ordered drug decreased and given with belladonna.

24th. Now at forty-grain dose again, and eruption has reappeared. Ordered iodide decreased rapidly.

April 1. Epididymis now plainly enlarged, while testicle is soft and much decreased in size.

15th. Discharged. Epididymis greatly reduced in size.

This case is included merely to illustrate the class to which an orchitis may, as it disappears, leave behind a still enlarged epididymis, which, in the absence of reliable history, could be mistaken as the primary and sole affection.

A somewhat similar case of orchi-epididymitis is the following:

CASE VIII.—A. J., aged 28 years; was admitted September 22, 1891. He had had a chancre seven years before, followed by secondaries, and on admission showed signs of syphilis. Eleven weeks before, the left testicle had become swollen, and when I first saw him, on January 1, 1892, the epididymis was now alone affected, being enlarged and tender on manipulation. He was discharged cured March 7, 1892.

The diagnosis of syphilis of the epididymis must be made from a variety of other conditions, but while urethral epididymitis of course leads in frequency, we must bear in mind that parenchymatous enlargement may take place from a variety of systemic or general affections already enumerated, while those forms which have occasionally been attributed to rheumatism or gout are probably to be referred more

accurately to urethral or syphilitic causes if carefully analyzed. In acute blennorrhagic epididymitis we have the discharge and the acute onset, with pain, to render the diagnosis clear, while in the chronic urethral form the tail is the part of the epididymis most frequently left hard, and there is a history of urethritis usually not very remote. In the pseudo-tubercular variety, with nodular indurations often marked by accompanying hydrocele, the diagnosis is more difficult, but concomitant evidences of syphilis will assist. Here, too, the diagnosis must be made from tuberculosis, and coincident evidences of tuberculous disease in other organs must be looked for or excluded. If patient is syphilitic, and has recently had a gonorrhœa, the difficulties are increased. The pseudo-tuberculous epididymitis is peculiarly indolent and not influenced by iodides, and some cases will have to undergo a period of observation before a positive opinion can be vouchsafed.

When fibrous changes have taken place after a chronic gonorrhœal inflammation, much care must be exercised to avoid faulty interpretation of the condition.

As a rule, the globus major is alone or primarily affected in syphilis, but as this is true also of tubercular change, it has no great diagnostic value as between these two states. Diagnosis must also be made from cancer, sarcoma, fibrous tumor, cyst, etc.

In cancer there is inguinal adenopathy and possibly cachexia.

The early diffuse syphilis of the epididymis, or syphilitic epididymitis proper, is usually confined to the globus major, though cases are recorded in which the tail has been alone inflamed, and often the body suffers too. The enlargement may be either rounded or irregularly square or angular, and not often much larger than an American chestnut. There appears to be a decided tendency for both epididymes to suffer coincidentally or one after the other. If other diagnostic features are not sufficient, the fact that the infiltration entirely and quite promptly disappears under anti-syphilitic treatment makes its nature clear.

Sequelæ are usually absent, while after gonorrhœal epididymitis fibrinous remains are apt to show themselves for a long time, especially about the tail.

The gummy tumor of the epididymis may occur quite early or very late, as seen in instances cited. If small gummy nodules are scattered through the organ, especially the globus major, there may be but little enlargement, while if a diffuse gummy mass has formed, the tumor may surpass the normal size of the whole testicle several times over. Such gummata may, in being absorbed, leave the organ atrophied. Here the diagnosis is more especially to be made from orchitis gummosa, and from gumma involving both testicle and epididymis, while those showing great plate-like masses, as in Case V., may simulate vaginalitis or periorchitis prolifera, but in the latter the thickened mass would not melt away under

iodides, as they did in this case. In orchitis the scrotal skin is here stretched tense, and the veins are more distended.

CASE IX.—Mr. F., a young man aged twenty-four years, came to my office in October, 1890. He stated that the left testicle had given him trouble for five years. He had first had an abscess in the left groin, which, he said, had “dropped down,” forming an abscess in the left testicle, which had ruptured through the scrotum, and shortly after had a perineal abscess. The testicle trouble had left a fistula, which was still discharging at the time I first saw him. There was a history of gonorrhœa four or five years ago, which patient stated had begun after the inguinal and scrotal abscesses, which he thought were in no way connected with urethral trouble. He had never had any previous venereal disease, but gonorrhœa once since, and never any evidences of syphilis, which he says was excluded by the physician who then treated him, as was also tuberculosis, or, at least, bacilli were sought for and not found. The condition, he said, was pronounced simple inflammatory.

Five months ago the right testicle began to give trouble, and a small “lump” formed in the lower part, just like that which had appeared five years before on the left side preceding the abscess. This lump had given no pain until three days before I saw him, when an acute swelling began, attended with adhesion between the scrotal skin and parts covered by it, and a puckering-in of the tissues.

Examination showed the left epididymis enlarged, firm, nodular, painless to pressure, and from the region of the tail to the most dependent part of the scrotum was a discharging fistula, about which the tissues were all bound down by firm bands, and a second opened on the external surface of the scrotum. The testicle was small, as though atrophic and sclerosed.

The right epididymis appeared about three times its normal size, was thickened, knotty, and irregular. The tunica vaginalis was found filled with fluid which, according to the history, had accumulated rapidly and for the first time. This fluid, amounting to about eight ounces, I drew off without injecting the sac. Ordered iodide of potassium, and mercury and belladonna ointment. I did not see the patient again for nearly a month. In the meantime there had been no further pain, but the hydrocele had returned to about one-third its original size. The iodide in ten-grain dose had produced salivation and pain in the jaw, so it was dropped to one grain, and gradually increased. The general health had improved, and the left epididymis was surely in a better condition. Ten days later I drew off five ounces of fluid. Treatment continued. In less than a month the upper fistula on the left side had closed, and the enlargement of the epididymis had apparently decreased in size, but became more dense. On the right side hydrocele fluid was reaccumulating.

January 6, 1891. In attempting to draw off fluid, the tumor of epididymis was accidentally punctured, a little bloody fluid was drawn off, patient fainted, and operation was postponed. This I will here state, was the last attempt to treat the hydrocele surgically, and although the fluid was only removed in very small part at this time the remainder was absorbed, and to the present time has not returned. Patient was now put upon the tannate of mercury, three grains daily.

20th. Left testicle has seemed to become more more atrophic. The

second (lower) fistula has ceased discharging; the upper remains closed. patient says there has been wonderful improvement on both sides.

Upon the right side the skin has ruptured where adhesions were present when patient came under treatment, three months ago, and a fistulous opening is now discharging yellow pus.

March 12. Right epididymis decidedly smaller; fistula discharging.

October 22. Patient says he took about two ounces of iodide during the summer. Ordered tannate pills gr. $\frac{1}{2}$, three daily.

November 29. Gradual improvement. No fluid in sac; no soreness, and sense of weight gone. Whole enlargement much decreased; testicle soft and small. Whole epididymis larger than normal, and globus major quite hard. Fistula on both sides discharging slightly. Tannate continued.

I did not see the patient after this for a year, and his treatment was neglected.

November 13, 1892. Patient states that fistulæ healed, and there was no discharge for a long time. The scrotum contracted well up about the testicles, rendering a suspensory no longer useful, and patient considered himself about well.

In December, 1892, the patient contracted gonorrhœa, and there was a swelling upon the right side, and the fistula opened again, and shortly after a new fistula formed high up on the left side. Ordered saturated solution of iodide, gradually run up.

February 1, 1893. Examination showed epididymis on both sides still somewhat firm, irregular, and slightly enlarged. The most recent fistula was discharging a small amount of watery fluid. Patient considered himself in a satisfactory condition, and has not been seen since. The iodide was ordered continued.

Now, in the above case, in spite of much interrupted treatment, there has been a very great improvement—so great, in fact, as to encourage a hope of complete cure if treatment could be faithfully carried out. The case looked at first, and continued to look, so much like tuberculosis, that in spite of the benefit from the anti-syphilitic remedies, I was never willing to say that it was specific. Indeed, I believe that in spite of the small amount of iodides and mercury consumed, we have reason to expect more prompt and lasting results. There is one thing, however, which I firmly believe, and that is, that the man is better off, mentally and physically, having his manly powers preserved in a state of functional activity, than if his testicles had one or both been extirpated, even if they had been found when slit open upon the operating-table to be filled with tubercle.

Now, as concerns the question of abscess and fistulous formation in gummous infiltration, they may occur, as we have seen from Cases III. and V., in both of which gummy abscesses of the scrotum ruptured externally, and in one of which a fistulous opening remained, and discharged for some time. Affections of the albuginea have been considered more likely to result in this way from their superficial situation, but in these cases there seemed no doubt that the process started in the epididymis. Gumma of the

cellular tissues of the scrotum alone would be freely movable over the tail of the epididymis, which could be distinctly separated from it, which was here not the case. Ricord's view, that when suppuration of the scrotal tissues took place it was always due to changes in the cellular tissue, rather than in the testicular parts, is clearly faulty, and Rollet plainly showed, in 1861, that gumma of the testis could soften and discharge externally, and I have myself seen a gummy testis discharge itself externally with the formation of a large fungus.

That fistulæ may disappear under iodides is shown in two instances here recorded. The condition is at best rare in which a fistulous tract reaches the testicle, but instances in which they connect the epididymis with the outer world are still more rare. Cases in which persistent fistulous openings have existed have been too often subjected to castration, more especially in former times. Thus, West records two instances, one seven and the other four years after the chancre in which this operation was done, and on examination in one case disseminated gummata were found in both epididymis and testis, and in the other a fibrinous deposit, causing adhesion to the skin and breaking down of the lowly organized product. This was in 1859. To-day, I have no doubt, these testicles would have been saved by the iodides.

MADISON AVENUE AND 59TH STREET.

A CASE OF TUBERCULOSIS OF THE SKIN SIMULATING LUPUS ERYTHEMATOSUS AND ERYTHEMATOID LUPUS VULGARIS.¹

BY W. A. HARDAWAY, M.D.,

PROFESSOR OF DISEASES OF THE SKIN IN THE MISSOURI MEDICAL COLLEGE, ST. LOUIS.

THE following case is, I think, of sufficient clinical and pathological interest to warrant its publication.

The patient is an intelligent pharmacist, of about twenty-eight years of age, who has hitherto enjoyed good health. His father and mother, and a sister a few years younger than himself, are living and well. There is no tubercular history in the family.

The young man himself is quite tall and spare, and has a markedly sallow complexion. Although he looks frail and delicate, and has looked so for a number of years, he is capable of great endurance. The following notes were taken from time to time during the past year.

Last May (1892), Mr. N. noticed on his left malar region a small yellowish elevation of the size of a pin-head, which he thought was a

¹ Read at the Seventeenth Annual Meeting of the American Dermatological Association, Milwaukee, September 5, 1893.

"flesh-worm," but when it was squeezed only blood came from it. This gradually enlarged peripherally, and became hard and red. There was no pain or other subjective symptom. When he first came under my care, in June, 1892, this lesion was as large as a dime, with an atrophic, whitish centre, surrounded by a slightly raised, infiltrated, dull-red border. The affected area seemed markedly anæsthetic, a feature that has been noted in connection with the tubercular syphilide. This anæsthesia was only temporary, and the parts soon regained their normal sensibility. At this time the patient passed from under my observation for about a month, and in the interval was given a thorough anti-syphilitic treatment by a physician who did not agree in my opinion of the case. This treatment did no good, but only aggravated the general and local condition.

September 3, 1892. The original lesion is now as large as a half-dollar. It is not raised, but upon picking up the skin it is found to be moderately infiltrated. The centre is atrophic and of a somewhat dirty-yellowish color, but at the borders there is still a narrow dull-red line.

In the middle of September several small acneiform pustules appeared suddenly on the face. There was one on the right temple below the hair, one on the side of the nose at the interior angle of the right eye, one on the end of the nose, one on the right ala, and, lastly, one on the left cheek near the angle of the mouth. They gave rise to no pain or other symptoms. Each papulo-pustule was surrounded by a narrow red areola. The red borders extended, became infiltrated, and crusts formed over the centres of the lesions. These scales or crusts were fatty or sebaceous in character, and with the dull-red surface beneath were suggestive of lupus erythematosus. When in the course of weeks the borders kept on extending, the centres cicatrized and presented the same dirty-yellow appearance as in the original patch.

December 9th. Thiosinamine was given hypodermatically at 12 M., and, according to the patient's statement, about 7 P.M. the patches became hot and red, and remained so for an hour or more. I may say here that a number of similar injections were given, but no permanent effect on the disease was obtained.

22d. The lesion under the right eye is now as large as a quarter-dollar. The centre is pale pink-looking and depressed, while the border is dark red, and still extending. The spot on the left temple has been thoroughly electrolyzed, but still spreads. At this date a new spot was found on the chest, which looked in the beginning like an acne papule, capped by a small pustule, but in the course of a few days this latter dried into a small yellowish crust or scale. In about two weeks or more this crust became detached, and revealed a purplish-white atrophic centre. Synchronously with this process the slightly elevated red border had extended until it was as large as a pea in circumference. At this stage it was thoroughly destroyed by electrolysis. It is quite likely that all the lesions pursued a similar method of evolution, but owing to interruptions in observation, the effects of treatment, and the merging of lesions into each other, it has been a difficult matter to make continuous observations.

Some time early in January a small piece of skin was excised from the lesion on the right temple for microscopical examination. The original patch, and the one on the left cheek, were deeply electrolyzed, with an apparent cure of the disease; but after a few months there was a relapse of the process, which manifested itself by the formation of a scab in the

centre of the scar. When this scab was removed there was exposed a deep-red surface that showed plainly against the pink of the cicatrix. These spots were electrolyzed as soon as they appeared, and with apparent success. In March, a small patch similar in all respects to the others appeared on the scalp in the right anterior parietal region. It is now the size of a dime.

The tendency to peripheral extension has been a marked feature; and finally, when the whole nose was involved, and became a continuous sheet of partly red and partly cicatricial integument, the likeness to some forms of lupus erythematosus was most striking. I think this appearance would have been still more suggestive if the patches on the side of the face had been allowed to coalesce; but in these places the electrolysis seemed to bar their onward march.

At no time could the nodules of lupus vulgaris be demonstrated in spite of repeated attempts and after applying the usual means for their detection (such as rubbing on glycerin, etc.). It must also be stated that the sebaceous plugs of lupus erythematosus were not seen at any time, although the primary eruptive spots had the exact appearance of a papulo-pustular acne lesion.

The patient's general health has been poor. At one time he seemed on the brink of a general tuberculosis, but a trip to Colorado soon set him up again; after a few months, however, of hard work indoors he again began to lose flesh, to be again restored by a Western trip. I have just learned that his disease is apparently quiescent, and that he feels unusually well. Expert examinations of his lungs and larynx, that were made from time to time, showed nothing abnormal.

The excised portion of skin was sent to Dr. C. Heitzmann. On January 12, 1892, I received the following letter from him:

"NEW YORK, January 12, 1892.

"The piece of skin sent a few days ago was halved; one half being forwarded to my son for bacteriological research, the other half being placed in a one-half of 1 per cent. solution of chromic acid for histological examination.

"Dr. Louis Heitzmann reports the tissue holds tubercle bacilli in moderate numbers. The histological examination shows dermatitis all throughout, though in some places far more pronounced than in others. In the latter places I found crowds of inflammatory corpuscles replacing the fibrous connective tissue. These nests of inflammatory corpuscles are produced in the manner usually seen in tuberculosis. The epithelia of the rete mucosum are partly absent, partly transformed into inflammatory corpuscles. The root sheaths of the hairs are enlarged, the hairs themselves present and intact. Diagnosis: Local tuberculosis of the skin entirely in accord with the clinical diagnosis.

C. HEITZMANN, M.D."

It was apparent from the beginning that the patient was not suffering from any known form of syphilide, and this opinion was strengthened by the absence of any specific history, and the further fact that he had been subjected to a most thorough course of anti-syphilitic treatment; indeed, he grew steadily worse under mercury and iodide of potassium. Since, however, the microscopical examination has demonstrated the tubercular character of our case, it will be interesting to compare it clinically with other forms of tuberculous diseases of the skin, viz.:

First, tuberculosis of the skin proper, which occurs in the form of shallow ulcers in the vicinity of the lips; second, the tuberculosis verrucosa cutis (Riehl and Paltauf); and third, the various forms of lupus vulgaris.

The first two forms of cutaneous tubercular infection may be dismissed from consideration; but it remains to be seen if the symptoms just described bear any likeness to the erythematoid lupus vulgaris of Leloir. This last disorder simulates lupus erythematosus very closely, and only after careful and long-continued observation can its affinities to lupus vulgaris be detected.

Somewhat abridged, Leloir's description of erythematoid lupus vulgaris is as follows: It occurs on the face, rarely on the trunk, and never on the limbs. It appears as a large or small plaque, occasionally in one, two, or three patches usually on one cheek, but often invading the nose and both cheeks in a symmetrical manner, just as in butterfly lupus erythematosus. The affected surface has a more or less lively redness, which disappears in part on pressure. The surface is seen to be marbled by a sort of quadrillage of a red-brown or violet, in the midst of whose meshes may be found small white or yellow points. Fine vascular arborizations may also be noted, especially at the periphery. The erythematous surface is sometimes here and there lightly desquamative, and even covered with small lamellar crusts, which may have a seborrhœic aspect, particularly at the borders of the plaques.

The plaque is slightly elevated at the margins, and, when sufficiently old, depressed in the centre. Notwithstanding these striking points of resemblance between lupus erythematosus and erythematoid lupus vulgaris, it often happens that if the skin is stretched at the level of the zone of the active extension of the disease, it is possible to make out the small yellow miliary nodules of lupus vulgaris, which will present the usual physical characteristics of such nodules. These lupus tubercles are very difficult to find, however, and not always present at a given time.

Other points that establish the true lupous nature of this affection are the profound infiltration of the plaques, and the fact, upon which Leloir lays much stress, that there is a tendency to cicatrization at the periphery—an event, he claims, that never takes place in lupus erythematosus.

The lesions presented by my patient certainly correspond very nearly to this description, except that I can state most confidently that in one year's constant observation, and using every precaution, it was impossible to demonstrate the presence of lupus nodules, and, moreover, the infiltration was by no means so deep as one is led to infer is the case in the observations made by Leloir. Other minor points of difference may be noted also, but in the presence of the essential dissimilarity—that is, the absence of lupus tubercles—they may be passed over.

It is very interesting to remark that in every instance when the opportunity for watching the evolution of the disorder occurred, it was seen to begin invariably as an acneiform papulo-pustular lesion.

A careful perusal of Brocq's account, given in the first edition of his book, of what he terms fixed erythematous lupus, and which he regards as always tubercular, shows that he and Leloir are substantially describing the same disease. It will probably occur to many that in America, at least, we have not made these distinctions, and that we have habitually confounded fixed lupus erythematosus with the aberrant form or the *erythème centrifuge* of Bielt.

While I have no desire on the strength of a single case to differentiate a new form of tuberculosis of the skin from those already described (including lupus vulgaris in this category), I may be allowed to ask, Does it always follow that infection with the tubercle bacillus invariably produces only the clinical picture of lupus vulgaris, or tuberculosis cutis vera, or tuberculosis verrucosa cutis?

Barring mal-observation, it occurs to me that in the case just described we have the history of certain undoubted tubercular lesions of the skin which in some important particulars differ essentially from all others hitherto recorded; and it may be that future observations will confirm my suspicion that we are but beginning to recognize the manifold aspects of tubercular infection of the skin.

Finally, it may be asked by those who believe in the tubercular nature of the ordinary lupus erythematosus, why this case is not an example of that disease? Most dermatologists of to-day would reply at once that the discovery of the tubercle bacilli in the lesions disposes of the question.

Thus, Mr. Malcolm Morris, in an able paper read at the Second International Dermatological Congress, concludes that lupus erythematosus must be regarded as a chronic inflammation of the skin, local in its origin, and generally local in its course, unconnected, as far as our present knowledge goes, with any underlying constitutional state. It is true that certain physicians do not share this opinion, and look upon lupus erythematosus as directly or indirectly tubercular; still, by far the greater number of dermatologists regard it as a local disorder.

Leaving out of consideration the erythematoïd lupus vulgaris of Leloir, and the possible cases, such as mine, of tuberculosis of the skin that closely simulate lupus erythematosus, it is quite possible that the ordinary superficial butterfly lupus erythematosus is a purely local affection; but we have still to explain the disseminate erythematous lupus of Kaposi, of which I have reported two cases—a malady that in the beginning is of the ordinary type, but which later becomes widely spread, is complicated by formidable general and local symptoms, and not uncommonly ends in death.

But this is a subject too extensive to discuss in this place, and I shall conclude with the statement that our clinical conception of lupus erythematosus and tuberculosis of the skin is by no means precise, and is in need of a thorough revision, and perhaps extension.

PEMPHIGUS: ITS CLINICAL VARIETIES AND TREATMENT. WITH A REPORT OF UNUSUAL CASES.¹

BY WILLIAM THOMAS CORLETT, M.D., L.R.C.P. LOND.,

PROFESSOR OF DERMATOLOGY AND SYPHILOLOGY IN THE WESTERN RESERVE UNIVERSITY;
ATTENDING PHYSICIAN FOR DISEASES OF THE SKIN TO THE CHARITY HOSPITAL,
AND CONSULTING PHYSICIAN FOR SKIN AND VENEREAL DISEASES TO
THE CITY HOSPITAL, CLEVELAND, OHIO.

THE term pemphigus (*πέμφιξ*, bulla or blister) was first applied by Sauvages² to a febrile disorder accompanied by an eruption of bullæ which had been previously described by Lepoise in 1618, as well as under various names by Hippocrates, Galen, and Aëtius. Willan³ and Bateman,⁴ of England, in writing of this affection in 1808 and 1814, respectively, doubted the existence of the disease mentioned by Sauvages, but described an affection under the name of pompholyx, which we now recognize as pemphigus. The disease described by these authors as "an eruption of bullæ, appearing without any inflammation around them, without fever, and frequently recurring in the same subject," is clear to anyone who has had an opportunity to observe this well-marked affection.

At the outset it is well to bear in mind that although pemphigus is characterized by the presence of bullæ, yet these lesions are also encountered in other morbid conditions, such as syphilis, eczema, traumatism, etc. In these, however, the bullæ are either anomalous, or from the nature of the case entitled only to a secondary consideration, while in pemphigus they are the essential lesions and appear in successive crops.

VARIETIES.—Willan originally included in the same order erysipelas, pemphigus, and pompholyx.⁵ Later, erysipelas was eliminated, and pemphigus became the representative of the bullous group. Cazenave contributed to our knowledge of this affection when, in 1844, he so accurately described an exfoliative form of the disease. As recognized to-day, therefore, pemphigus presents two main varieties, pemphigus vulgaris and pemphigus foliaceus.

Pemphigus vulgaris, the form most commonly met with, is usually a chronic disease, in fact so rarely does it pursue an acute course that its existence is denied by Hebra⁶ and is not mentioned by Anderson.⁷ Yet as undoubted cases have been reported by such competent observers

¹ Read before the Mississippi Valley Medical Association, Indianapolis, October 5, 1893.

² Sauvages, F. B.: *Nosologie méthodique*, Class III., Gen. 3, Paris, 1770.

³ Willan: *Cutaneous Diseases*. London, 1808.

⁴ Bateman: *A Practical Synopsis of Cutaneous Diseases*. London, 1814, p. 139.

⁵ Bateman: *Medical and Physical Journal*, March, 1804.

⁶ Hebra: *Diseases of the Skin*, 1866, vol. i. p. 396.

⁷ Anderson: *Diseases of the Skin*, 1887.

as Cazenave,¹ Köbner,² Morrow,³ Allen,⁴ and Levisseur,⁵ its presence can no longer be questioned. The disease described by Sauvages as pemphigus, whose existence was doubted by Willan and Bateman, evidently belongs to this form.⁶

Acute pemphigus is ushered in by great restlessness, a decided chill followed by a rise of temperature, which sometimes registers 104° Fahr., or even higher. Usually, in a few hours the bullæ appear. At first about the size of a coffee bean, they soon attain the dimensions of a goose-egg. Not infrequently two or more blebs coalesce, when they are easily ruptured, leaving large excoriated surfaces resembling scalds. New bullæ appear from day to day, as former lesions go through the process of resolution and repair, leaving at first a reddish, which changes into a bluish macula, and in the course of a few weeks completely disappears. From the first there is great thirst and dryness of the tongue, followed by albuminuria, delirium, and prostration. In the case of an adult reported by Allen, the disease ran its course in about three weeks and ended in recovery; while, according to Brocq, acute pemphigus in a great majority of cases terminates fatally in from eight to ten days. Most of the cases reported have been observed in children.

In the chronic form the appearance of the bullæ, in a large majority of cases, constitutes the main feature of the disease. They spring from apparently healthy skin and attain a variable size—from a bean to a goose-egg or larger. Their epidermic covering is tense and either ruptures in from three to five days, or their contents, consisting of a translucent fluid which soon becomes turbulent, is absorbed, leaving reddish-brown spots which in turn disappear.

The process, therefore, consists in the appearance of successive crops of blebs as former crops undergo involution. The severity of the disease is dependent on the amount of the cutaneous surface involved. Relapses are the rule. The temperature usually remains normal. Recovery may take place after three or four months or in as many years. The morbid tendency, however, as a rule, disappears within a year. Sometimes the mucous membranes are involved and the disease presents other peculiarities as observed in the following case:

R. H., male, aged fourteen years, was seen November 9, 1889, with Dr. Edwin P. Hawley, of Cleveland, who said the disease began nine days previously with a disturbance of the bronchial tubes, presenting the usual symptoms of capillary bronchitis, and a peculiar whitish appear-

¹ Cazenave: *Maladies de la Peau*. Paris, 1847.

² Köbner: *Archiv für Dermatol. und Syph.*, B. I., 1869.

³ Morrow: *Atlas of Venereal and Skin Diseases*. New York, 1889.

⁴ Allen: *Journal of Cutaneous Diseases*, April, 1888.

⁵ Levisseur: Quoted by Allen, *loc. cit.*

⁶ "There is probably no such fever as that which has been described by a few Continental physicians under the titles of *febris vesicularis*, *ampullosa*, or *bullosa*, and to which Sauvages applied the term pemphigus." Bateman, *loc. cit.*, p. 136.

ance of the mucous membrane of the mouth, tongue, and fauces, which was thought to be diphtheritic (pemphigus diphtheriticus). A day or two after this there was a partial suppression of urine, followed by general œdema. With the subsidence of the œdema there appeared on the extremities pea-sized blebs of a reddish-brown color (pemphigus hæmorrhagicus, or purpura bullosa), which in turn increased in size and became translucent. With this very peculiar history I first saw the case. Objectively the patient presented the ordinary features of pemphigus. Bullæ, in size varying from a pea to three inches in diameter, were distributed over the extremities with a few small ones on the trunk. The only peculiarity noted was that some assumed a ringed form with a small bulla forming a nucleus in the centre. There was still some œdema of the feet and ankles. The mucous membrane of the mouth presented raw, bleeding surfaces, and the epithelium was exfoliating in loose shreds. The eyes were also implicated; the conjunctiva was opaque, and the sclerotic congested. The sight was markedly impaired.

Nov. 15. There was a noticeable subsidence of the bronchial disturbance and the mouth also was somewhat improved. The eyes were seen by Dr. B. L. Millikin, of Cleveland, and appropriate treatment adopted.

After this the case passed out of observation. Later, Dr. Hawley informed me that there had been several reappearances of the pemphigoid eruption, and that the sight was completely destroyed. Further, as a sequela, there had been extensive gangrene of the hands and feet (pemphigus gangrenosus). The entire course of the disease lasted nearly a year.

Pemphigus foliaceus, the second main division, is a rare form, and is characterized by the formation of bullæ with loose, flabby epidermic coverings, often scarcely raised above the surrounding skin. These soon rupture, discharging a serous fluid which soon undergoes putrefaction, giving rise to the peculiar cadaverous odor which is so characteristic of the affection. Later in the course of the disease this exudation, together with the loosened shreds of epidermis, dries into large scales or plaques, which feature gives name to this variety of pemphigus.

Sometimes it first appears as an ordinary pemphigus, taking on its peculiar features later in its course. More frequently, however, these are present from the beginning. This form more frequently attacks the mucous surfaces, which may be the parts first involved. On the skin the lesions extend at the periphery until extensive tracts, or the entire surface of the body is involved. The palms and soles frequently escape. The hair becomes brittle and lustreless, giving rise to alopecia more or less complete. The nails frequently undergo the same changes, or are cast off in the process of suppuration. Resolution does not take place, nor do the lesions heal so readily as in pemphigus vulgaris.

Pemphigus foliaceus is a graver malady than pemphigus vulgaris, and, as described by Cazenave, is a chronic disease. As modern treatises on dermatology do not mention an acute form, I wish in this connection

to put on record a few unique cases of acute epidermic pemphigus of the newborn.

March 13, 1888, I was asked to see a child post-mortem with Dr. Charles Gentsch, of Cleveland. The child had been assisted into the world fourteen days previously by a midwife, at which time, according to the mother's statement, it was fully developed, fat, and free from disease. Four days after birth there appeared a peculiar eruption about the angles of the mouth; the next day the genitals were attacked; from thence the eruption extended until fully three-fourths of the surface became involved. When seen after death, ten days after the onset of the disease, the skin looked as if it had been severely scalded. There were a few accumulations of serous fluid under the loosened epidermis, but for the most part the epidermis hung in partially detached shreds. The palms and soles were but slightly affected. The odor arising from the skin was strong and peculiarly offensive.

My first impression was that the child was a victim of congenital syphilis, this was further strengthened by the fact that the mother was a primipara, therefore more liable to beget syphilitic offspring, and according to her statement the disease first appeared on the parts so frequently implicated in this disease. A careful inquiry, however, failed to bring out any history of syphilis in either parent. On examination, three spots were found on the mother's breast about the size of a gold dollar, reddish in color, and covered with loosely attached epidermis, in appearance resembling some of the smaller lesions on the child. These spots had been present but a few days. Upon the abdomen there was a reddish rash which was not itchy—in fact, she had not been aware of its presence until subjected to examination.

There was no positive diagnosis made at the time, my entry being, "Either syphilis or pemphigus."

Within a fortnight I was again asked by Dr. Gentsch to see a case which he said resembled the one previously seen, and which had been attended by the same midwife.

The mother was a strong woman who had borne three other children who remained healthy. The little patient was plump and apparently doing well, when on the fifth day the disease appeared. At first the child was restless and passed a few greenish stools; a few hours later a reddish rash was noticed on the anterior surface of the neck, just under the chin. The following morning, about fourteen hours after the rash was first noticed, I saw the case.

At this time the eruption was limited to the front of the neck and the upper part of the chest. It was of a dark-reddish color, and on the neck the epidermis was raised into flat, transparent blebs which were easily ruptured. The following day it had reached the umbilicus, extending at the periphery in a continuous wave, its main direction being downward. Over the throat and upper part of the chest, the regions first invaded, the epidermis hung in loose shreds leaving in places extensive raw surfaces. There was present the same sickening, cadaverous odor that had been so marked in the preceding case. On the third day blebs appeared on different parts of the body; the child was failing rapidly and took but little nourishment.

On the fifth day the eruption was at its height. It consisted of a few small blebs, extensive raw surfaces, and floating areas of cuticle on different parts of the body. The face escaped, as did the hands and feet; on the forearms and legs but few lesions were present. Death took place on the sixth day of the disease.

While this case was under observation another under the same mid-wife was heard of, but an opportunity to see it did not occur. After this it was reported she had been induced to discontinue her vocation.

Although epidemics of this nature are rare, yet medical literature mentions others of a similar kind.

In 1868, Hervieux¹ reported a similar epidemic of pemphigus in the newborn, in France. Ahlfeld,² under the title of *Morbus bullosus neonatorum*, reported an epidemic in Leipzig in 1873. In Italy, also, Padova³ has, more recently, reported an epidemic. Two years later, in 1878, Ritter von Rittershain⁴ reported, under the head of *Dermatitis exfoliativa infantum*, 297 cases which he had observed during a period of ten years in the Foundling Asylum at Prague. The disease generally appeared between the second and fifth week, rarely before the end of the first week. The main features were: a prodromal stage of dry desquamation, followed by hyperæmia of the lower part of the face, less frequently on other parts of the body, which spread rapidly and was of a light-pink or purplish color. In some, the mucous membranes were also implicated. After this primary stage the eruption varied; sometimes there followed a dry exfoliation, at other times it was characterized by a serous undermining of the epidermis, or the formation of bullæ. The disease usually ran its course in from seven to ten days. Relapses, about eleven days after convalescence, were not infrequent, but they were milder than the primary attack. In typical cases there was no fever nor constitutional disturbance. As sequelæ, Ritter mentions furunculosis and gangrene, which were regarded as due to septic infection. The mortality was 48.82 per cent.

In America, Elliot⁵ has given a clear delineation of two cases.

In regard to the nature of this affection, as well as its relation to pemphigus, there has been a varied expression of opinion.

Litten, quoted by Elliot, believes it to be the pemphigus foliaceus of Cazenave. Kaposi⁶ agrees with Ritter that it must not be confounded with pemphigus. He regards it as an augmented physiological des-

¹ Hervieux: Pemphigus épidémique des Nouveau-nés. *Union Méd.*, Paris, 1868, 3e s., v. 374-377.

² Ahlfeld: Ueber eine Endemie von Morbus bullosus neonatorum in der Entbindungs-Anstalt zu Leipzig. *Arch. f. Gynäk.*, Berlin, 1873, v. 150-159.

³ Padova: Alcuni casi di Pemfigo in forma epidemica. *Gior. Ital. d. Mal. ven.*, Milano, 1876, xi. 30-48.

⁴ Ritter: *Centralzeitg. f. Kinderheilk.*, 1878, Band II.

⁵ Elliot: *AMER. JOURN. OF THE MED. SCI.*, January, 1888.

⁶ Kaposi: *Pathologie u. Therapie der Hautkrank.* Wien, 1881.

quamation of the newborn. Both Brocq¹ and Weyl² speak of it under the head of pemphigus, and regard it as such; while Elliot³ treats of it as a separate affection.

From the foregoing we may conclude:

First: That it is both endemic and epidemic. When endemic, it is confined to certain foundling asylums where the morbid agent which gives rise to it is harbored. When epidemic, it is due either to mediate or immediate contagion. And, as in the cases herein reported, it may be carried by midwives or others in whom the precepts of cleanliness are not scrupulously observed. Further, the lesions on the breast of the mother in the first case were, in my opinion, the result of inoculation from the child; for the baby's mouth was involved during the whole course of the disease.

Second: Its relation to pemphigus may not be definitely known until the etiology of pemphigus is better understood. Suffice it for the present to say, that clinically the cases herein reported are not distinguishable from pemphigus, as illustrated in the following:

Mrs. L., aged fifty-eight years, was seen with Dr. M. Rosenwasser, of Cleveland, February 21, 1888. The patient presented a well-marked eruption which involved various parts of the body. The regions of pre-eruption, however, were the folds of the groins, lower part of the abdomen, and inside of the thighs. The umbilicus looked like a suppurating cavity. In these regions, which were first involved, the skin was denuded of epidermis and presented raw, weeping surfaces with no tendency to heal. On other parts there were a few flabby blebs of various shapes and sizes. The nail of the left great toe had dropped off and the bed presented a suppurating surface. Several of the nails of the fingers were broken off, and, in some, commencing inflammation was noticeable at the root. The mucous membranes of the mouth and nose were excoriated and there was a slight conjunctivitis of the left eye. The bowels were regular, although there had existed at various times a tendency to diarrhœa; urine variable but without any special abnormal condition observed.

The previous history of the case was that menstruation had ceased eight years before at the age of fifty, since which time she had been "nervous," unable to sleep, and constipated. One year previous to the onset of the disease, the patient began to lose weight. The first symptoms of the present malady were noticed six months after this, in the form of excoriations in the mouth, which were persistent. These were followed in four months (two months before I first saw the case) by small blebs which appeared about the genitals and on the arms and neck. These burst readily, leaving moist itchy surfaces. The eruption gradually extended until large raw surfaces were exposed. The mucous membranes also became inflamed and painful, diarrhœa supervened, there was a gradual but marked decline from one visit to another, and the patient died of exhaustion March 20th, about three and a half months

¹ Brocq: *Etude crit. et clin. de la Dermatit. exfol. generalisée*; also, *Traitement des Maladies de la Peau*. Paris, 1892.

² Weyl: *Ziemssen's Handbook of Skin Diseases*, 1883.

³ Elliot: *Loc. cit.*

from the first appearance of the eruption on the skin, and seven and a half months from the first disturbance of the mucous surfaces.

This case is especially of interest in this connection, because :

First: The eruption was a striking counterpart of that seen in the epidemic of the newborn, and strengthened my belief in their relationship. The first series certainly pointed to contagion, while in this case there had been no exposure to a like disease and no other cases have since developed in the neighborhood.

Second: The eruption, although corresponding to the early stage of pemphigus foliaceus, under which it was classed, also answered in the main to the description given by Neumann¹ of a rare form which he denominates pemphigus vegetans. This tendency of the skin to take on a fungoid growth, or to break down in the form of gangrene, as has been previously noted, may, it seems to me, be regarded as an anomaly or sequel rather than a distinct variety of the disease.

TREATMENT.—This naturally divides itself into constitutional and local. Arsenic, once the panacea for all the ills to which the skin is heir, has been forced, step by step, to yield the palm, yet according to Mr. Jonathan Hutchinson it still retains the distinction of being a specific for pemphigus. Dr. Crocker, in his admirable work, believes arsenic controls the skin lesions without affecting materially the course of the disease. In children he thinks it deserving the name ascribed to it by Mr. Hutchinson. In observing the treatment of pemphigus in various hospitals, as well as in the cases occurring in my own service, I have never observed the slightest benefit from arsenic. This forces me to the conclusion that as yet we have no trustworthy specific for pemphigus.

With this in view the internal treatment should be conducted along the lines of general therapeutics. Food should be selected which is easily digested, although possessing the elements for proper nutrition, such as milk, eggs, etc. In pemphigus, above all diseases, tonics are indicated. Iron and arsenic, the latter in small tonic doses, and in selected cases cod-liver oil, will afford the best means at our command.

Locally, the general hygienic environment should be looked after, fresh air and sunlight should never be forgotten, and, in an epidemic, isolation and disinfection, such as recommended for smallpox and erysipelas. Then, the blebs should be punctured and the sac flushed out with some bland disinfectant, such as the saturated solution of boric acid. This is followed by one of the many applications, which above all must be of a bland, soothing nature. Everyone who has been in the Allgemeines Krankenhaus, in Vienna, is familiar with the continuous water baths there used in the treatment of pemphigus. This undoubtedly constitutes an agreeable and efficient local treatment, but unfortunately

¹ Neumann : *Viertelg. f. Derm. u. Syph.*, vol. xii., 1886.

the necessary appliances are not obtainable in many private houses nor even in most hospitals.

An ordinary bath-tub may, however, be utilized for short periods, when a starch, bran, or alkaline bath may be used with great relief to the patient and some benefit to the skin.

Of lotions, the glycerole of tannin has given the most marked benefit. It may be used in the strength of one part to three of distilled hamamelis or water. This strength may be increased to equal parts of the glycerole of tannin and camphor-water. When the eruption is limited to small areas, the glycerole of the subacetate of lead and glycerin, of each one ounce added to a pint of water, often acts admirably. When itching is present resorcin or carbolic acid are the best agents we possess for allaying it. These are used in the form of lotions, one drachm to four ounces of water. Sometimes cloths saturated with a bland oil prove most grateful to the patient.

During convalescence, especially in the exfoliative form, some emollient, such as vaseline or the benzoated zinc ointment, is to be recommended.

A CASE OF LOCOMOTOR ATAXIA BEGINNING IN THE ARMS.

BY J. K. MITCHELL, M.D.,
OF PHILADELPHIA.

G. V., aged forty-seven years; machinist; single; resident of Nashville, Tenn.; consulted me on November 7, 1891, and gave the following history:

He had never had any serious illness, though commonly suffering from headache from childhood. In 1879 or 1880 he contracted syphilis, which, he says, was thoroughly treated for a long period of time, but he had some secondary symptoms in the mouth and a superficial discoloration of the skin.

In 1885, six years before he was seen, he first noticed a numbness in the middle finger of the right hand. Upon consulting a physician the old history of chancre came out, and he was treated with electricity and iodide, which did not stop the course of the disease, for in two weeks the whole left hand had become numb. Entire loss of touch-sense followed rather rapidly in the left hand and at a longer interval in the right. A deep prick, a burn, or a hard squeeze was perceived; but a slight touch, a gentle prick, or mere warmth was unnoticed.

This disturbance of skin sensation gradually extended to the elbow in both arms, and within two years of its first beginning he suffered from flying pains in the back of the neck, in the hands, and occasionally through the legs. In the upper extremities these were felt in the whole of the hands and in the thumb-joints. Incoördination began to be noticed at about the same time that the pains first grew troublesome.

Present condition: Headache is very constant, and whereas formerly it was chiefly localized about the inion it is now general. There is pain up and down the spine and almost constant ache and cramp in the

stomach, which is made worse by medicine of any kind yet taken, or by the liquor which has occasionally been given to him as a palliative. His pain is not affected by food; he has no indigestion, and has on one or two occasions had an increase of the cramp, lasting for a long period. In June, 1891, for instance, a violent attack came on, apparently without cause, with cramp referred to the stomach, and persisted for two weeks. The first two fingers and thumb of the right hand have enough sensation to be useful, but the others and the left hand are practically useless, so entirely without touch-sense are they. The pain in the hands is often excessive and accompanied by a distinct fibrillary twitching in all the small muscles of the hand. There is marked incoördination in the hand and forearm movements. He cannot bring his forefingers together with his eyes shut, and does not know whether a small object is in his grasp or not until he sees it; but, as stated above, he uses the first two fingers and thumb of the right hand better than those of the left. The feeling of numbness and the loss of sensation stop abruptly at the elbow, above which sensation is not at all impaired. There is no tenderness over the nerve tracks in the arm. In the feet, touch and localization are perfect. Pain-sense is slightly impaired, and there is a constant feeling of numbness in the feet.

A difficulty of balance was first noticed in 1889, most marked, as usual, in the dark. This has grown worse very slowly. It was at first irregular, and not so constantly bad as now. Knee-jerk absent; no reinforcement; muscle-jerk in legs absent; elbow-jerk absent; muscle-jerk in forearms good; cremaster-reflex good; no ankle clonus; sexual desire is diminished.

His pupils react well to light and to accommodation. The left is a trifle larger always than the right. Station: sway is almost entirely forward and to the left; on careful measurement it was found to be ordinarily about two inches forward and to the left, even when standing with his eyes open. With closed eyes this was a little increased. Electric contractility is everywhere unchanged. The general nutrition is excellent and his muscles large and firm.

His muscle-sense was examined with small weights. In the right hand he readily distinguished a difference of one-half ounce. In the left hand this was not perceived. He could not perceive at all the presence of weights of about one-half drachm in either hand.

The lumbar spine is slightly tender to a blow throughout its whole extent, but there is no deformity. There is no urinary or bowel trouble. The patient is an unusually large and powerful man and has suffered no diminution of his muscular ability. He is quite bald, but he was so many years before having syphilis.

A diagnosis of locomotor ataxia, beginning in the arms, was made, and late in October he was sent to Dr. de Schweinitz for a report on the condition of his eye-ground for confirmation of this opinion. Dr. de Schweinitz wrote as follows:

"The patient has discolored optic disks, undue fulness of the central lymph sheaths, and haziness of the margins. The pupils are unequal: the right nearly round and two millimetres in diameter, the left in area an irregular oval and three millimetres in its longest diameter. The pupil reactions are normal; there is no paralysis of the external eye

muscles, but the relation between the abducting and adducting power is greatly disturbed, adducting being but 15° while abducting is 6° . At six metres there is insufficiency of the internal recti half a degree, while in accommodating there is insufficiency of the external recti of three degrees. Central vision is normal, by correction of a slight hypermetropia. The field is symmetrically contracted and concentrically for form and color."

This examination confirmed the diagnosis of a rare form of tabes. The patient, a poor man, was advised not to go to the expense of staying away from home for treatment, but, after instruction as to how to use suspension, he was put upon nitrate of silver with massage and electricity, which he was able to secure at his home.

The course of the case in this patient was somewhat unusual, even apart from the manner of its beginning. The sudden onset with rapidly spreading and increasing loss of sensation in the upper extremities, sharply limited to the forearms, even six years after its first appearance, is peculiar; it was not until four years had passed that any disturbance of locomotion was observed, and even at the date of examination this had not made his gait noticeable, while sensation for touch and locality was perfect in the legs and feet. No certain information could be gotten from the patient as to the date of commencement of the ocular symptoms. These, indeed, were not such as would have attracted much the notice of an ignorant person.

Very little attention is paid to this form by the numerous authors who have written upon ataxia. In the several contributions of Charcot I can find no special mention of it,¹ and in a careful search but one fully reported case has been found. Hammond does not mention it, nor Ross, Leyden, or Erb; in Vulpian's *Maladies du Système Nerveux* it is spoken of as an occasional form of appearance of the disease, but no stress is laid upon its rarity.

The only case reported in this country, so far as my examination of the subject has allowed me to discover, is the one published in the *Journal of Nervous and Mental Diseases* (April, 1888) by Dr. S. Weir Mitchell. Recognition of this form should be easier than of the ordinary mode of onset, as slight difficulties of co-ordination in the hands would be apt to strike the patient much more than similar trouble with the lower limbs.

¹ Charcot quotes (*Leçons sur les Mal. du Syst. nerv.*, 2e Série: *Anomalies de l'Ataxie locomotrice*) a case reported by Pierret, in which the symptoms—pains, incoördination, etc.—were developed to a very high degree in the upper extremities, but only as part of a general ataxia. The case is cited as an example of the pathological conditions in ataxia.

A CASE OF FRACTURE AND DISLOCATION OF THE SECOND LUMBAR VERTEBRA, WITH OPERATION.

By RICHARD C. NEWTON, M.D.,

MONTCLAIR, N. J.;

ATTENDING SURGEON MOUNTAINSIDE HOSPITAL; SURGEON TO THE NEW YORK AND GREENWOOD LAKE RAILROAD.

WITH A REPORT OF THE MICROSCOPICAL EXAMINATION OF A SECTION OF THE SPINAL CORD.

By HENRY POWER, M.D.,

NEW YORK CITY;

PATHOLOGIST TO THE MOUNTAINSIDE HOSPITAL.

H. P., aged twenty-four years; single; teamster; born in New Jersey. Has a slight admixture of African blood, although he is very nearly white. Admitted to the Mountainside Hospital, January 12, 1893.

Previous and family histories not of especial significance, except that the patient claimed to have come of healthy stock, and that he had never suffered from any serious illness in his life. He distinctly denied all venereal lesions.

On admission the patient was quite helpless and was suffering acutely from an injury to the back, which he had sustained in the following manner: He was driving a team of horses attached to an excavating wagon, of which the driver's seat was very high. In attempting to drive into a barn he did not notice, until it was too late, that there was almost no space between the jamb of the door and the seat of the wagon. There was some ice upon the road and upon the approach to the barn-door, and the patient's horses were smooth-shod. As the latter approached the door they began to slip, and naturally quickened their pace to get inside the barn. The patient tried to hold them back, and finding this impossible, he dropped his reins and tried to slide or roll off of his seat. In an instant he was caught between the door-jamb and the high back of the wagon-seat and pinned there until the team had pulled the wagon into the barn.

He fainted away from pain and shock. After the door-jamb had been passed there was more room and the patient was pulled down from his exalted position and medical aid summoned. He thought that there was rather more than six inches of space between the door-jamb and the back of the wagon seat.

When admitted to the hospital he was perfectly conscious, and, after morphine had been administered hypodermatically, passed a fairly comfortable night. The next day he was not suffering any pain. His bladder was full of urine, of which he had passed none since his accident. He was completely paralyzed as to both sensation and motion in both lower limbs. The line of anæsthesia in front was at Poupart's ligament, and behind at the upper extremities of the gluteal eminences—thus corresponding to the seventh zone of anæsthesia in Prof. Starr's tabulation (*THE AMER. JOURN. OF THE MED. SCI.*, July, 1892). According to the Professor's observation this line of anæsthesia indicates a lesion of the cauda equina and filum terminale at the level of the second lumbar vertebra, and in my case the injury was afterward proved to be

at this point. There was complete loss of the reflexes, both deep and superficial, below the seat of the injury. The patient could not feel the passage of the catheter, although he felt relieved after the water was drawn. The surface temperature was apparently somewhat raised over the lower limbs, but of this there was no certainty at the time, inasmuch as it took a day or two to procure a surface thermometer. The feet were also warm. But the ankle clonus could not be elicited. Although the rigidity of the joints of which Starr speaks (*ibid.*) was noticed, it was impossible by tickling or pricking of the soles of the feet to awaken any sensation or provoke any movement, reflex or otherwise. There was no priapism. No emesis. There was at this time no deformity nor bulging of the spinal column. No crepitus could be detected. None of the vertebral spines seemed to be missing or displaced. No bruises, lacerations, nor ecchymoses—in a word, no evidence of external violence was found on the man's body, although carefully looked for, and none subsequently appeared. It should be stated in passing, that the man was a short, stocky, heavily muscled person, and his spinal column was, well walled in with firm muscular tissue.

For the first three days after admission the temperature in the mouth was 101° F.; pulse 80 to 86. Two drachms of compound licorice powder produced a copious stool, of which the patient was unaware. On the morning of the third day some bulging backward of the spine was noted in the upper lumbar region. A plaster jacket was put on the patient, extending from the axillæ to the hips. During its application he complained strenuously of pain, and twice nearly or quite fainted away, so that he had to be let down from the apparatus in which he was suspended and laid flat upon his back on the floor until he revived.

The plaster jacket seemed to make him somewhat more comfortable and he could pull himself about in the bed by his arms. He complained more or less constantly of pain in the abdomen. Some suspicious-looking round, black spots appeared on his heels, and a number of small, oval, red ones. His urine was drawn three times daily with a soft catheter.

For three days careful observations of the surface temperature were made with a Seguin's surface thermometer, about six minutes being consumed in an observation. They were as follows: Temperature on front of abdomen near umbilicus, 99°. Front of left thigh between hip and knee, 97°; right, 94½°. Front of left arm between shoulder and elbow, 97°; right, 98°. Front of left thigh between hip and knee, 99°; right, 97°. Front of right thigh between hip and knee, 96½°; left, 98½°. Front of right arm between shoulder and elbow, 97½°; left, 95°. As these results seemed inconclusive the observations were discontinued.

After a period of eight days without a movement from the bowels, the patient experienced great distress from tympanites of the abdomen, which became so excessive as to embarrass the respirations. Accordingly two drops of croton oil were given, and were followed in an hour and a half by an exceedingly copious action of indescribable fœtor. This gave temporary relief, but was the beginning of fecal incontinence. About this time several small blebs were noted about the feet and ankles.

On the 27th of January, after a consultation of the entire hospital staff, an operation was determined upon in the hope that something might be accomplished for the relief of this man's pitiable condition. The uncertainty and danger of the proposed operation had been explained to the patient and his friends and their full consent to it obtained.

It seemed better not to wait any longer, because the patient was daily losing ground, and we feared that he would not be in a condition for operation if a period of six weeks was allowed to elapse, as suggested by Dr. White and others, before undertaking an operation. Accordingly, I proceeded to operate with the assistance of my colleague, Dr. Love, and Drs. Ward, Whitehorne, and Francis, of the hospital staff. The plaster jacket was cut up the back and removed. There was a moderate posterior bulging of the upper lumbar vertebræ, and the most prominent of these seemed to be the second. We had agreed to do an Abbé's operation. A longitudinal incision, six inches long and one-half inch to the right of the vertebral spines, was made, beginning at the tenth dorsal vertebra and extending to the sacrum. The tissues were divided down to the laminæ of the vertebræ. It was then observed that the second lumbar vertebra was displaced by having been rotated to the left, so that the hollow between the spinous and right transverse processes of this bone was nearly or quite in the median line of the back. The spinous processes of the remaining vertebræ were in their proper alignment. A strong hook was employed, and several attempts were made to rotate this bone into its proper place, but without success, although an extraordinary amount of force was used.

The arches of the first and second lumbar and the right transverse process of the latter were then cut away with a long pair of bone-forceps, exposing the medullary canal. The spinal dura mater had been torn by the original injury, so that only a small portion of the segments of the spinal cord that we had exposed was covered by its membranes: In fact, only a triangular-shaped piece of the dura mater, with its hypotenuse running from above downward and from right to left, was found. This covered probably a fifth of the two segments; the remaining four-fifths of the dura mater we could not find. Of the cord itself a fusiform enlargement was observed, which probably increased the diameter of the cord by 50 per cent. This was purplish in color. No spiculæ of bone and no blood-clots were observed in the medullary canal; nor so far as could be ascertained was there any pressure being exercised upon the substance of the cord. The patient now began to exhibit unmistakable signs of collapse. The operation had been long and bloody, and inasmuch as it seemed that little good and much harm might follow further manipulation, it was decided to close the wound and do nothing further. Considerable difficulty was experienced in stopping the hemorrhage, which was venous in character and welled up between the cut surfaces of bone. Affusions of hot water and pressure from sponges wrung out of boiling water finally stanching the flow of blood, and the wound was closed. A strip of iodoform gauze was used for a drain. The deep sutures were of catgut, specially prepared and kept in closed glass tubes. The muscular tissues were brought together with sutures of silkworm-gut. Every approved antiseptic precaution had been observed. Abbé's operation had, of course, proved impracticable owing to the displacement of the second lumbar vertebra.

The patient was profoundly shocked by the operation. The next day his pulse was 132 and thready; temperature, 102° F.; and respiration, 28. In forty-eight hours the temperature fell to $97\frac{1}{2}^{\circ}$, and then rose again to $102\frac{3}{4}^{\circ}$, at which point it remained until death. On January 31, 1893, five days after the operation, the patient had rallied somewhat and we felt some encouragement about his chances of recovery, albeit

there had been no improvement whatever in the symptoms caused by the accident. On February 1st, however, his condition again became alarming, and he died very quietly shortly after midnight, five and one-half days after the operation, and twenty-one and one-half days after the injury.

An autopsy was forbidden. A hurried and surreptitious examination of the wound, however, revealed the following condition of things: There was no odor and almost no pus about the cut surfaces. A thin coating of lymph was noted over the exposed muscles, and indicated a healthy healing process. There was considerable laceration of the deeper layers of muscles from the original injury and from the use of the cutting forceps. The intervertebral substance between the first and second lumbar vertebræ was fractured nearly through. The body of the second lumbar was broken—the line of fracture beginning near the middle and running downward and forward to near the junction of the anterior and lower surfaces. A fracture of the intervertebral substance between the second and third lumbar, and of probably at least two of the articular processes of these vertebræ, must have existed, although from lack of time all the lesions could not be accurately made out. The swollen and discolored portion of the cord noted at the operation was removed and turned over to Dr. Henry Power, the pathologist of the Mountainside Hospital, for examination. His report is as follows:

“The portion submitted for examination consisted of many of the roots forming the cauda equina, and also some more compact material among the fibres. The relations of the tissue to surrounding parts were in no way indicated. The tissue was hardened in bichromate solution of 2½ per cent., and then in alcohol. Sections examined by Weigert stain and picro-acid fuchsin. The compact material above referred to was not part of the cord, as had been hoped, but consisted of blood-clot and some adhesions binding together the nerve roots. All the nerve fibres showed with the Weigert method the various stages of degeneration. No evidence, however, of the exact location of the injury causing the same was obtainable from the specimen.”

The explanation of the displacement and rotation to the left of the single vertebra (the second lumbar) seems to me to be that the patient was struck when leaning forward and to the right side, as he endeavored, when too late, to throw himself from his seat to the ground. (He would naturally sit on the right end of the wagon seat to drive, and would also naturally get on and off his wagon on the right side.) The habit of the colored race of ducking the head when danger threatens is well known; he therefore ducked his head and was struck by the door-jamb upon the right shoulder. His spine was already bent forward as much as possible as he was endeavoring to slide off of the seat and avoid the door-jamb at the same time. The blow broke his back at the point of the greatest curvature, the second lumbar, and also, since the legs were now held fast by having passed under the door-jamb, the same force displaced the entire spinal column above the fracture to the left. As, however, the wagon passed on, the man's body was drawn between the high back of the wagon-seat and the door-jamb, and since it could not pass with its transverse diameter perpendicular to the opposing surfaces, the body was forced on to the back, and the lateral dislocation was by

this means reduced while the body was passing under the door-jamb. The second lumbar vertebra, however, was prevented from resuming its place with its fellows, because it was held fast by the high seat-back, a board about an inch wide. Thus the intervertebral substance between the second and third lumbar must have been fractured and the articular processes broken, if they had not been broken before. A lateral displacement with rotation would also account for the peculiar diagonal tear to the theca, and the partial reduction of the dislocation would account for the disappearance of the missing portion of the membrane, which was probably folded away against the side of the bony canal under the injured cord. Whether the above explanation be the true one or not, it is plausible.

It is true that the best authorities seem united in the belief that a total abolition of the reflexes signifies a complete transverse destruction of the cord, and also many of them hold that in cases exhibiting these symptoms an operation is contra-indicated. But considering the low seat of the lesion in my case, there is good authority for operating, as, *e. g.*, Prof. White, in the able summary of the "Surgery of the Spine," already referred to (*Ther. Gazette*, October, 1891), says (p. 680): "As to the region involved, both theoretical and statistical considerations show that the lower dorsal and lumbar vertebræ are those which can be operated on with the greatest hope of success." And again (p. 682): "That it is unsafe to say in any given case that the cord is *hopelessly* damaged would seem to be fairly well established by the results of such cases as Horsley's, Macewen's, and Lowenstein's, so that operation should scarcely be refused on that score alone." And again (p. 683) he quotes Chipault as saying "Trephining is absolutely indicated . . . when there is compression of the filum terminale from any cause." And finally Dr. White lays down amongst the conclusions to his paper the following: "Resection of the posterior arches and laminae should be resorted to in all cases in which there is compression of the cauda equina from any cause." Having then so good authority for operative interference in this case, I cannot think that any injustice was done our patient by submitting him to an operation which, while it was by no means successful, has taught some valuable lessons, and at the worst only abridged by a comparatively short period a life already doomed, and thereby doubtless eliminated much suffering.

The increasing number of reported operations undertaken for the relief of spinal injuries is, in my opinion (as Prof. White also holds), rather encouraging than otherwise to those surgeons who favor surgical interference in these cases; and who shall say that Sir Astley Cooper overstated the truth when he asserted that if one patient out of one hundred could be saved (by operation), it would be better than could be hoped for from Nature alone?

REVIEWS.

AN AMERICAN TEXT-BOOK OF GYNECOLOGY, MEDICAL AND SURGICAL, FOR PRACTITIONERS AND STUDENTS. By HENRY T. BYFORD, M.D., J. M. BALDY, M.D., EDWIN B. CRAGIN, M.D., J. H. ETHERIDGE, M.D., WILLIAM GOODELL, M.D., HOWARD A. KELLY, M.D., FLORIAN KRUG, M.D., E. E. MONTGOMERY, M.D., WILLIAM R. PRYOR, M.D., GEORGE M. TUTTLE, M.D. Edited by J. M. BALDY, M.D. With 360 illustrations in text and 37 colored and half-tone plates. Pp. xxi., 713. Philadelphia: W. B. Saunders, 1894.

THE tendency of American publishers to multiply the number of popular systems and text-books, representing the combined work of several authors, has been unfavorably commented upon by foreign critics. In the case of some of these, it must be admitted, the *raison d'être* has been difficult to discover. When, therefore, such a work appears which even the most critical must admit is a distinct addition to the literature of gynecology, it cannot be dismissed with the ordinary trite expressions of approval, which always cause the author (conscious that he has put his best work into his book) as much depression as positive blame from an appreciative critic, who has at least done him the honor of reading it.

The volume before us must be judged from the editor's standpoint—not as a treatise on gynecology, but as “a working text-book for physicians and students.” Viewed in this light, we predict that it will be unusually successful. The collaborators are well known as aggressive, enthusiastic teachers, progressive surgeons, and clear, forcible writers, a combination which ought to be irresistible. The novel plan has been adopted of endeavoring to sink each author's individuality by harmonizing the articles in accordance with the general plan—an original and not unattractive feature. With some exceptions, the editor has been quite successful in the accomplishment of this by no means easy task. The arrangement of the subject-matter savors more of a foreign than of an American work on diseases of women.

The eighteen chapters, or, more properly, subdivisions, are arranged in the following order: Gynecological examination and operative technique, menstruation, sterility, anomalies, genital tuberculosis, diseases of the vulva and vagina, diseases of the uterus, lacerations, fistulæ, displacements, malignant disease, uterine neoplasms, pelvic inflammations, ectopic gestation, diseases of the ovaries and tubes, diseases of the genito-urinary tract, and a concluding section on after-treatment in gynecological operations. It must be admitted that, at least as concerns the last half-dozen sections, the sequence is not as smooth as it might be, possibly because the headings are a little misleading. For example, the chapter on “Uterine Neoplasms” really includes fibroids only, malignant growths having

been discussed in the previous sections. Again, the heading "Diseases of the Ovaries and Tubes" is inexact, since tubal affections (with the exception of anomalies) have already been thoroughly considered in connection with the subject of pelvic inflammation. The excellent concluding chapter on after-treatment is, with the addition of the treatment of coeliotomy cases, really a summary of the paragraphs on the same subject which follow the descriptions of various minor gynecological operations. The latter arrangement is certainly more natural, as well as more convenient for the general reader.

We commend the introductory sections on gynecological examination and operative technique, which are clear, terse, and to the point. The recommendation to examine under anæsthesia in every doubtful case is one which meets with our hearty approbation; indeed, teachers of gynecology cannot too strongly caution their students not to be misled by the prevailing statements as to the ease with which the pelvic organs can be mapped out by the bimanual in office practice. More emphasis should have been placed upon the value of palpation in the lateral position, which is certainly a valuable aid in the diagnosis of obscure enlargements of the adnexa and peri-uterine tissues. The directions with regard to the use of the sound (page 34) are wise and conservative.

In the introduction to the chapter on technique we note several apothegms which are worth remembering. For example, technique is defined as "the basis or pervading principle of the work," as the result of "individual operations crystallized in various forms," "the quickening element in the whole field of modern gynecology," etc. We have no criticism to offer on this chapter, which contains a large amount of useful information condensed within a small space. The illustrations are nearly all good.

Menstruation and its anomalies are discussed clearly and intelligently, an excellent feature of this chapter being the attention paid to the important subject of the menopause and its disturbances.

The chapter on inflammatory diseases of the uterus is written in a vigorous style and is eminently progressive, especially the section dealing with septic endometritis. The term "endometritis" has become so wedded to the condition which is really hypertrophy of the endometrium that, although the author recognizes its erroneous application, he does not feel justified in abandoning it. The description of curettage is clear and graphic. We commend it to the practitioner as an ideal picture of a minor gynecological operation as it should be done, according to the rules of modern aseptic surgery. The section on curettage in acute pelvic inflammations may be a little too progressive for conservative readers (at least in private practice), who may not be disposed to go so far as the author in his belief that it "is positively indicated in every case of acute tubal and peritoneal disease, when there is even a suspicion that the infection originated in the endometrium—that is, in the majority of cases." The writer summarizes, on page 229, in the following vigorous language: "One of three methods must be adopted with these cases: either poultices and hot douches, curettement and treatment of the uterus as any septic cavity, or a primary coeliotomy. The first is the method of the midwife (!), and merely allows the infection to work its will in the pelvis; the second is surgical in every sense of the word; while to adopt the third in every case stamps a man as blind to reason

and to the work of other men, and as willing to open a fellow-being's abdomen rashly and unnecessarily." We have no comment to add except to express grave doubt as to the ability of the general practitioner to select cases in which he would not be more likely to do harm than good.

The operations for the repair of lacerations of the cervix and perineum are rather briefly considered, and the criticism must be offered that the illustrations accompanying the description of the former are not exactly after nature. The writer is evidently not an enthusiastic advocate of the operation, since he remarks rather skeptically that "it may well be doubted in many cases if the rest has not been the most important, if not the sole, factor in the recovery." We have not met with many patients in either private or hospital practice who would be willing to allow the cervix sutures to remain *in situ* for three months, during which time matrimonial relations are interdicted. Doubtless the latter restriction would be beneficial if it could be secured.

In the excellent chapter on malpositions we note only a few minor blemishes; for example, the directions for introducing a pessary. We have already held that the general practitioner would be less likely to avoid the error of not replacing the uterus first, against which the writer cautions him, if the instrument were inserted when the patient is on her *side*. Curiously enough, Figures 224 and 225 represent the way in which a pessary should *not* be used, *i. e.*, with the organ still retroverted. The various operations for retroversion and prolapsus are well described. Fig. 252 does not, of course, represent the method of colporrhaphy described by Emmet, but the simple oval denudation of Dieffenbach.

In the section on malignant diseases we are impressed in reading the admirable description of vaginal hysterectomy with the fact that the writer is more at home with the radical than with the palliative treatment of carcinoma uteri. Witness the recommendation to amputate and suture the cervix as in Figs. 262-267. Schroeder's operation (Figs. 266 and 267) is hardly applicable to malignant disease; in fact the writer characterizes it as an "illegitimate procedure." No one who had followed carefully Dr. Byrne's work with the galvano-cautery would dismiss his method with the remark that "the only commending feature of the procedure is its bloodlessness," or that amputation "can be performed more safely" with the Paquelin cautery. We have already had occasion to commend the beautiful illustrations showing the use of clamps and ligatures in vaginal extirpation. On page 394 we find superficial papilloma of the ovary described as identical with carcinoma, while at the top of the following page we read of similar papillary growths "soon becoming carcinomatous," a statement which is calculated to confuse the general reader, especially as the important distinction between the two, from a surgical standpoint, is not explained.

The chapter on fibroids (misnamed "Uterine Neoplasms") is essentially surgical, the writer advocating total abdominal extirpation. His description of the operation is lucid and intelligent, the accompanying illustrations being especially helpful. To the abdominal surgeon the arguments presented may be sufficiently convincing; whether the radical operation should be recommended to the general practitioner as the treatment *par excellence* we do not attempt to decide.

The section on pelvic inflammation is the longest in the book (eighty pages), and, as explained in the introductory sentence, "is intended to

include all those pelvic inflammatory diseases which involve the Fallopian tubes, the ovaries, the pelvic peritoneum, and the pelvic cellular tissue." It is a thoroughly practical article, especially the section on pathological anatomy, and is evidently written by one who has studied the subject in the dead-house and at the operating-table and has not built up theories in the library. Equally practical are the paragraphs on symptoms. The important subject of treatment is handled in a most satisfactory manner. We have never read a more careful and conscientious description of abdominal section for the removal of diseased adnexa. The indications, difficulties, and subsequent results of the operation are described in the most candid and convincing manner. Altogether this chapter is deserving of warm approval. Ectopic gestation is well discussed, especially the sections on diagnosis and treatment. Ovarian cysts and ovariectomy receive careful attention, the operation and complications being described in a clear, practical way. The chapter on diseases of the urethra, bladder, and ureters covers the ground remarkably well, considering the necessary amount of condensation, the concluding section on the ureters being especially interesting and instructive. We have already referred to the chapter on after-treatment, and again commend it as containing just such precise information with regard to the minor details as the general reader generally looks for in vain in most surgical works.

One cannot do justice to such an extended work in a hasty review. We have merely sketched in outline its general plan and character. Though uneven and not always coherent (as every system by different authors must be), it must command attention and respect as a worthy representation of our advanced clinical teaching. Conservative gynecologists will doubtless say that many of the statements are too radical and dogmatic for the student and practitioner. Some of the writers recognize only one way of doing things, and that is their own; but it is refreshing to meet with a book in which, whether right or wrong, the author has the courage of his convictions and speaks them in no uncertain tone. The editor is to be congratulated on his success in the accomplishment of a task more difficult than that which usually falls to the lot of that unfortunate individual. The plan of the work was bold and novel, and we believe that its success will prove that it is thoroughly *en rapport* with the spirit of the age, the motive force of which is the energy of youth.

As to the internal construction of the book we may add that the style throughout is clear, concise, and forcible. No words are wasted, nor does a single writer turn aside from his subject to indulge in self-laudation. There is a singular unanimity in this respect which fully compensates for any unevenness or repetition. The type is large and the illustrations, to a considerable extent, original, although the latter vary greatly in their excellence. The half-tones are much more pleasing to the eye than are the colored plates, which do not add to the attractiveness of the book from an artistic standpoint.

H. C. C.

THE STUDENTS' DICTIONARY OF MEDICINE AND THE ALLIED SCIENCES.

Comprising Pronunciation, Derivation, and Full Explanation of Medical Terms, together with much collateral descriptive matter, numerous Tables, etc. By ALEXANDER DUANE, M.D., Assistant Surgeon to the New York Ophthalmic and Aural Institute; Reviser of Medical Terms for Webster's International Dictionary. Pp. 650. Philadelphia: Lea Brothers & Co., 1893.

THE enormous development of sciences tributary to medicine and the constant increase in nomenclature are sufficient reasons for the production of a new dictionary. While this one is for students, according to its title, it aims to include every word which a physician is likely to encounter in the medical literature of the day. How well this purpose is accomplished a careful examination cannot fail to show. In addition to ordinary material, it is especially rich in chemical and biological terms of recent coinage, particularly those of modern organic chemistry. Even many trade names of recent date will here be found, such as salophen, antifebrin, europen, listerine, aristol, and the like. The object sought is to make the book of practical use, and that object is accomplished.

Many anatomical data are exhibited in tabular form. For example, canals, joints, muscles, arteries, nerves. By the method adopted it is possible to give many details in a form convenient for reference. For example, each artery has opposite its name its origin, lateral branches, terminal branches, and their distribution. Each joint has its arterial supply, nerve supply, and function given, as well as the bones and ligaments which enter into it. Useful words of the class which includes *centrad*, *cephalad*, *meson*, and *mesial* have not been omitted. One may remark, however, under *centre*, a failure to locate Broca's speech-centre on the left side, though the cross reference is correct. One fails to find also, among varieties of hernia, that described by Littre.

Thirty-four pages are devoted to *Bacteria*. Here may be found in condensed tabulated form an enormous amount of information which cannot ordinarily be found in text-books. In the table opposite the name of each organism appears in parallel columns its origin and morphological characters, the temperature at which it flourishes, and its properties. An interesting list follows indicating those diseases which are produced by bacteria, and giving also those organisms which appear to be simply associated with disease. Under each drug is given a summary of its uses, together with the preparations which are official in the United States, Great Britain, and Germany. The doses are given in the metric system as well as in that more generally in use.

An attempt has been made to relieve the embarrassment, felt by all, from the common use of the names of men in connection with operations, diseases, etc. One may here find a definition of Loreta's operation, of Tait's, of Battey's and of Hunter's. So, too, he will find briefly described Hutchinson's teeth, Horner's muscle, Bigelow's ligament, Bandl's ring, the Banting treatment, Senn's plates, and McBurney's point. However much one may decry such use of proper names as being unscientific, it is a convenience to find them in one's dictionary. Of additional value is an abbreviated description of the man whose name is

used. One is reminded, for example, under *Goulard's cerate* that Goulard was a French surgeon of the eighteenth century; and under *Bauhin's valve*, that Bauhin was a French-Swiss anatomist of the sixteenth century.

In spelling, the author designs to follow usage rather than analogy, according to his preface. Simplicity, at times, yields to derivation. He prefers the diphthong in "hæmorrhage" and all compounds similarly derived. He prefers "chorioid" to choroid, "anthelminthic" to anthelmintic, but gives "feces" rather than *fæces*.

The attention to minute detail necessary in the presentation of a work of this character is little appreciated by the general reader. That a book so accurate, so convenient in size, and withal, so complete, has been produced is creditable alike to author and publisher. G. E. S.

THE DISEASES OF THE MALE ORGANS OF GENERATION. By W. H. A. JACOBSON, M.Ch. Oxon., F.R.C.S. With eighty-eight illustrations. Philadelphia: P. Blakiston, Son & Co., 1893.

JACOBSON, an assistant surgeon in Guy's Hospital, is already favorably known on this side of the Atlantic because of his excellent work entitled *The Operations of Surgery*, a work which compares well with Treves's or any other standard productions on the same subject. It is only fair to expect from such an author a book of more than ordinary merit, and in this expectation the reviewer is not disappointed. Curling's classical monograph, the scholarly volume contributed by Monod and Terrillon, indeed, the whole literature of the subject, has been carefully traversed.

In regard to the functional efficiency of a retained or ectopic testicle, Jacobson holds that before such a testicle has been subjected to repeated attacks of inflammation it is still capable of secreting healthy seminal fluid, and quotes cases in point. Later, however, degeneration takes place. In regard to the treatment of misplaced and inflamed testes, this, the author holds, should be palliative at first. If inflammation recurs, choice of operation will lie between transplanting and castration. Where the patient has passed adolescence, the latter operation is the one of choice. The complications of misplaced testes are more fully considered than in any work with which the reviewer is familiar. The operation of orchidopexy is described in detail.

The chapter on hydrocele and its complications is classical. It is pointed out that, in the palliative treatment of hydrocele, septic inflammation may occur from the use of a dirty instrument, and at least one case of a death is recorded from this cause. In the radical cure, iodine and carbolic acid are the injection substances of choice. From a statistical study, Jacobson states that in a cold climate there may be expected about 8 or 10 per cent. of relapses after injection. As to the technique of this injection operation, it is advised to inject about five grains of cocaine solution in a drachm of water; in about five minutes the iodine is injected without pain or fear of constitutional symptoms. At least one death has been recorded from the injection of a quantity of cocaine no larger than that advised by the author. Strapping the testicle is ad-

vised in from the fourth to the fifteenth day after the injection, and is to be repeated every few days for a few weeks, and after this a suspensory bandage is to be worn.

Antiseptic incision is advised where iodine has previously failed, where the sac is large and has thick walls, and in certain cases where the hydrocele is complicated by hernia. The varieties of hydrocele are described at length, and hæmatocele receives due consideration, particular attention being called to the condition of the testicle in many of the long-standing cases.

Under the head Epididymo-orchitis, the disease commonly classed as epididymitis is discussed. The treatment is that commonly advised; ice being recommended during the first two days. Immediate puncture of the vaginal tunic is advocated when acute hydrocele is present and there is severe pain. Puncture of the testicle itself is strongly condemned, except in cases of pus in this gland. The application of silver nitrate, one drachm to the ounce, painted with a camel's-hair brush over the surface of the swelling, is also advised. In discussing the varieties of orchitis, the author does not omit to include that form of inflammation which develops in immediate connection with acute tonsillitis.

The section on Tubercular Testis is one of the best in the book. In summarizing the treatment, Jacobson advises general hygienic directions in the early stages. In a certain number of well-to-do patients it is safe to wait until softening has occurred; then the sharp spoon is employed. Castration is advised when erosion fails, when the body of the testicle is involved, and when hydrocele, especially the purulent form, is present. It is stated that tuberculosis of the testicle is more common in infants than is usually thought to be the case. The operation of castration is fully described.

In discussing Masturbation, the author calls attention to the fact that this habit is by no means rare in infants, and recommends as a part of his treatment circumcision without an anæsthetic. Under the general heading, Diseases of the Testicle, is given Continence as a sub-heading. The author strongly insists on the teaching that this is entirely compatible with health, an opinion with which most practitioners will coincide.

While speaking of spermatorrhœa, it is stated that, apart from nocturnal emissions, there is no such thing as escape of seminal fluid without the patient being aware of it. This ground is scarcely tenable.

Sexual hypochondriasis is treated by general hygienic directions and internal medication. The application of nitrate of silver to the prostatic urethra is also advised. In discussing the beneficial effect of marriage upon such patients, Jacobson voices the feeling of every right-minded man in saying: "A wife is not to be looked upon as a mere therapeutic agent."

The chapter on Impotence closely follows the teaching of Gross, to whom due credit is given. This subject and Sterility are briefly treated.

The second part of the book is devoted to Diseases of the Cord. Here, again, the classification is admirable. In discussing Varicocele, it is stated that the operation is advisable when the dilated veins prevent entrance to public service, when the disease persists, or steadily increases, in spite of treatment, and is accompanied by much annoyance, when the testicle is undergoing atrophy. The operation of choice is the antiseptic excision of the dilated veins.

Excision of the scrotum as an adjunct to operation on the cord, is not mentioned.

The third part of the book deals with affections of the scrotum. The little that is known in regard to disease of the seminal vesicles is well summarized in the few pages devoted to this subject.

The book closes with a full section on Diseases of the Penis. In treating of phimosis, attention is called to the fact that hernia frequently complicates it, and that it is a common cause of premature sexual excitement. Usually, circumcision is to be advised, excepting when the patient is the subject of hæmophilia or diabetes. Minute directions are given for the performance of the operation.

There is an extremely interesting chapter upon chronic induration of the erectile tissue of the penis. In considering priapism, it is stated that this affection may be an early symptom of leukæmia. Its association with gout is, of course, well known. There are no new suggestions in regard to treatment.

After describing amputation of the penis for epithelioma, Jacobson states that castration is in many cases to be performed in connection with this operation.

It is to be hoped that in a subsequent edition of this work, which undoubtedly will be called for, the author will append a section upon diseases of the prostate, since this is beyond cavil a genital organ. It cannot be claimed that there is much new or original advanced by Jacobson. This could scarcely be expected, since the ground has previously been so fully traversed in the famous monographs already mentioned, and in the special articles found in systems and encyclopædias, such, for instance, as those of Duplay and Reclus, Holmes's, and the German and French encyclopædias. The especial value of the present work lies in the fact that the author has enlarged the admirable structure built by his predecessors, by the addition of nearly everything of importance bearing on this subject which has appeared in modern literature; that he has arranged and formulated detailed knowledge so that it is readily accessible, and that he has been scrupulously careful to allot credit where it is due. The work is worthy of the cordial support of the profession. It is well illustrated and carefully indexed. American writers will find that their contributions have not been slighted. E. M.

ELECTRICITY IN DISEASES OF WOMEN AND OBSTETRICS. By FRANKLIN H. MARTIN, M.D., Professor of Gynecology Post-graduate Medical School of Chicago, Attending Surgeon Women's Hospital of Chicago, Gynecologist to the Charity and Post-graduate Hospitals, Member of the Chicago Gynecological Society, and of the American Gynecological Society, etc. Second edition. Chicago: W. T. Keener Company, 1893.

PERHAPS it is too much to expect that a work on electrical gynecology should be written by an accomplished physicist. It is certainly true that no real student would go to a work of the limits of that before us for his knowledge of electrical science. Consequently much of the material in the four opening chapters is out of place. It constitutes a strange admixture of the extreme elementary, the purely technical, and

the ultra-theoretical. Too little is presented for the needs of one who would master the subject, while the use of technical words and phrases with obscure definition, or none at all, would make these chapters unintelligible to the beginner. The writer is not at his best when discussing laws of magnetism and of electricity. An example of careless wording is as follows: Static electricity is said on page 17 to escape, among other ways, by "conviction" [*sic*] when "there is a great accumulation of electricity in a conductor with much strain, when a constant passage of electricity through the surrounding particles of air takes place and is swept away by the electric wind which it creates, and which is an essential part of the phenomenon." In this portion of the work the writer's indebtedness to various authors is duly acknowledged, but he may be said to have found the work of condensation difficult, and to have accomplished it at the expense of clearness.

The ten chapters which succeed are mainly devoted to the description of apparatus. The name of a well-advertised maker is rather too expansively displayed upon many of the cuts, so as to form one of their most conspicuous features. See the full-page illustration of a dynamo. To ornament the face of an otherwise very simple diagram with such a name in heavy type is absurd. See Figs. 1 and 3.

Near the middle of the book the treatment of fibroids is reached, and methods are briefly indicated. Electro-puncture is reserved for otherwise hopeless cases, "in which the Battey-Tait operation or hysterectomy do not offer an average chance of success in the hands of expert operators" (page 144). He makes it only *per vaginam*, and has seen pus develop but once out of a score of cases (page 178). Seventy-five per cent. of fibroid tumors of the uterus should not reach the knife. A short series (13) of "successful" cases is given. They were under observation for periods varying from three months to fourteen years, and were of various types, but relatively small, a few reaching the umbilicus.

In some of them, at least, where disappearance of the growth was noted, the diagnosis of fibroid might fairly be questioned when the well-known limitations of pelvic diagnosis are recalled. In case No. 2 the constipated bowels, hemorrhoids, leucorrhœa, and dysuria speak of general local congestion. The cervix was large and patulous, while the uterus "appeared at least *double its natural size*, smooth and regular in contour, with a disproportionately enlarged fundus" [*italics ours*]. This case he calls "one of the few actual cures," but the description suggests rather a congestive hyperplasia, with endometritis, than a fibroid, and it is not remarkable that four months of treatment with relief of the constipation should reduce so small a uterus to the normal size.

Four cases are detailed as failures.

In electricity for the resolution of inflammatory exudates the author has much confidence. His results in the treatment of vomiting of pregnancy have "always been a source of unusual gratification."

Strictures of the rectum due to inflammatory infiltration, syphilis, or cancer may be relieved in almost all cases; and, where not cancerous, may often be cured. As to carcinoma, he says that there are now on record a number of well-authenticated cases of cures by the Parsons method. By this is meant the passage of a strong interrupted galvanic current, which does not destroy normal tissue, but is said to cause cessation of the growth (page 210). The very next sentence is, "Of course, it is yet too early to say that these cases are permanently cured." He has

just used the words, "well-authenticated cases of cure." It is just this loose usage of the word cure which weakens the statements of so many writers on electrical gynecology when they talk about actual new-growths.

G. E. S.

DISEASES OF THE SKIN. An Outline of the Principles and Practice of Dermatology. By MALCOLM MORRIS, Surgeon to the Skin Department of St. Mary's Hospital, London, etc. With 8 chromo-lithographs and 17 woodcuts. 12mo., pp. 556. London: Cassell & Co., 1894.

THE title very properly suggests the contents of the book. It is truly "an outline of the principles and practice of dermatology," the subject-matter from beginning to end being handled in an easy, *currente calamo* style, which renders it the more attractive to the reader. The author is not only entirely familiar with his subject, but has a happy way of giving concisely the chief points of the many diseases discussed. We are of the opinion that the value of a book upon any special branch of medicine depends largely upon the manner in which the author brings the principles of general medicine to bear upon his topic. Without general pathology upon which to rest the whole structure, there can be no good work done on a specialty.

With such views uppermost, we therefore naturally turn to the introductory chapters on the pathology of cutaneous diseases. After giving a brief statement of the present status of inflammation, and alluding to the fact that many diseases which were formerly regarded as new growths are in reality inflammations, the subject of the bacteriology of the skin is taken up. Stress is laid upon the important rôle which the staphylococci play in suppurative processes, with special reference to folliculitis, sycosis, furuncle, carbuncle and impetigo contagiosa, and to those diseases in which a specific bacillus has been demonstrated.

In the classification of cutaneous diseases, the author states that no formal scheme is put forth, although an attempt is made to group them etiologically. We are disposed to question the advisability of adopting his method of classification for cutaneous diseases, captivating as it is for certain fixed diseases, like the animal parasites, for it leads away from symptomatology, upon which, after all, we must depend practically for the study and treatment of these diseases. Thus, while we note the grouping together of a large number of diseases dependent manifestly upon nerve disorder, other well-known diseases, which are sometimes neurotic, such as eczema and psoriasis, are allowed to stand alone, unprotected by any classification.

Among the many new things in the book, we desire to direct particular attention to the chapter on vaccinal eruptions, to which the author on former occasions, as is well known, has given special study. Two principal groups are made: 1. Eruptions due to pure vaccine inoculation. 2. Eruptions due to mixed inoculation—that is, those due to the vaccine virus together with some other virus.

Under these two headings every kind of eruption connected with vaccination may be classed, the list being a long one. This subject, we think, is handled in a very satisfactory way, and it is justly pointed out

that the accidents of group 2 are preventable by using pure vaccine lymph together with antiseptic precautions.

Concerning the contagiousness of leprosy, which is now agitating the whole world, the opinion is expressed that "it is certain that leprosy is not contagious in the sense in which syphilis is contagious, but only in a limited sense, like tubercle. The bacillus may be implanted by contact, but it can only take root when the soil is particularly favorable to its development." With this view we are entirely in accord from our own observation and studies, and we believe the doctrine to be not only conservative but sound.

Under the head of "general inoculable diseases" is found tuberculosis, the lesions of the skin now known to be of tubercular origin, according to Mr. Morris, including (1) Those conditions formerly called scrofulous, and still, for convenience, grouped under the common term of scrofuloderma; (2) the tubercular ulcers, strictly so called, occurring in regions exposed to direct infection in persons suffering from pulmonary or intestinal tuberculosis; (3) verruca necrogenica, or post-mortem wart; and (4) lupus vulgaris. The rarer diseases, which at the present day are under discussion, are duly considered. Of these, adenoma sebaceum, keratosis follicularis, acanthosis nigricans, molluscum epitheliale, cutaneous psorospermiosis, angiokeratoma, lymphangioma circumscriptum, xeroderma pigmentosum, pityriasis rubra pilaris may be mentioned.

Throughout the pages occur woodcuts, for the most part well executed, illustrating the clinical features of certain rare diseases, while eight original chromo-lithographic plates, with two pictures on each plate, grace the volume. They are admirably drawn and artistic, though some of them, we think, are too intensely colored, a fault common with most English portraits. They add distinctly to the value of the book, the several eczemas of the ear being perhaps the best of the series.

It may be said that the work is worthy of the author, who has labored so faithfully in England to advance this branch of medicine. It is a reliable and impartial exposition of the subject, written from a strictly practical standpoint, and we commend it heartily to the profession. The volume is small and compact, but contains a great deal in a condensed form.

L. A. D.

THE HEALTH OFFICER'S POCKET-BOOK. By EDWARD F. WILLOUGHBY, M.D. Pp. 376. London: Crosby Lockwood & Son, 1893.

THIS is a very handy work, particularly adapted to the needs of medical officers of health. The sections on mathematical practice and meteorological practice are very useful; that on demography and statistics contains many valuable facts and suggestions which may with great benefit be utilized by public health statisticians. Other sections deal with engineering memoranda, duties of medical officers of health, inspection of meat, sanitary arrangement of houses, potable water, dietetics, and scavenging. Although written with particular reference to English conditions, there is much of interest to American readers. Part II. deals exclusively with English sanitary law.

C. H.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE
MEDICAL SCHOOL AND HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

THE TREATMENT OF NEURASTHENIA.

DR. MONTEUVIS apparently believes that "all neurasthenics without exception are arthritics (Vigouroux)." The medical treatment consists in the administration of the alkalies, the use of electricity, particularly of Franklinization, two means which favor oxidation and combat the weakening of nutrition. The dietetic treatment, so far from being a super-alimentation, is really a diminution of the nourishment, and this is essential. Further, it is important to use laxatives which increase the gastro-intestinal and biliary secretions and assure to a certain extent general antiseptics, thus preventing auto-intoxication. In addition the habitual constipation of the neurasthenics is thus relieved.—*Journal des Practiciens*, 1894, No. 9, p. 103.

METALLIC ELECTROLYSIS.

DR. MARGARET A. CLEAVES defines the term metallic electrolysis as a "method which makes use of the chemic action of the positive pole both upon foreign substances—that is, metals such as copper, zinc, and iron, and the tissues at the same time." Ordinarily, in galvano-caustics, chemicals are manufactured by electrolysis out of the tissues themselves—at the positive pole, acids; at the negative, alkalies—which are in turn directed against diseased states. In metallic electrolysis, however, there are found certain new salts which are utilized in the treatment of disease. Gautier showed by his laboratory experiments that there was an actual decrease of weight in copper electrodes after use. Further, it was found that when muscular tissues or mucous membrane were submitted to the action of a copper anode, an oxychloride of copper was formed. In order to ascertain the action of this copper salt upon the uterus of a rabbit, forty intra-uterine applications were made of ten

minutes' length, with five minutes for reversal of the poles, at three days' intervals. It was demonstrated that there was—1, an appreciable deposit of copper salt on the entire surface of the mucous membrane; 2, a complete penetration of these salts into the tissues; 3, there was found one salt, oxychloride of copper, which is insoluble, and another, an organo-metallic salt which was soluble. In comparing the microbicidal action of the oxychloride of copper with the positive pole of the constant current with an unoxidizable electrode, it was found that the copper salt is much more effective than the galvano-caustic method. Further experimentation showed that in metallic electrolysis the properties of the current which are constantly active are the electrolytic and the cataphoric. So far as conductivity is concerned, the human body may be regarded as a two per cent. solution of sodium chloride. By electrolysis of the tissues in contact with the positive pole, there are set free oxygen, acids, and chlorine. These in turn attack the soluble metallic electrode, whether sound or needles, and there results an oxychloride of copper, zinc, or iron, as the case may be. The cataphoric property of the current—which after the formation of the salt electrolytically, causes it to penetrate the tissues rapidly in a zone around the sound or needle to a greater or less extent—is equally important. This method is not a caustic one, as in ordinary galvano-caustic applications, simply because the organic acid which is set free attacks the oxidizable electrode instead of the tissues. The newly formed salts of the metals of which the electrode may be made are diffused into the tissues, producing an elimination and a repair which takes place without pain and without inflammatory reaction. This method is characterized by low intensities and long sittings, as opposed to the high intensities and short sittings of the galvano-caustic methods. The advantages of metallic electrolysis over topical applications of sulphate of copper in stick or in solution, of zinc in paste or solution, or of iron in solution, are—1, the ability to localize the medicinal action of the metallic salt which is used directly upon the diseased surface, as, for instance, at the bottom of a deep sinus; 2, the drugs are introduced into the system in a nascent state, and thus are more active; 3, by cataphoresis the salts thus formed are driven into the tissues, rather than laid upon the surface as in ordinary topical applications; 4, there is obtained at the same time the beneficial action of the physiological properties of the currents. The technique of the treatment is that of any galvano-caustic application save that the positive pole is always the active one, and for the usual electrodes there are substituted needles and sounds of copper, zinc, and iron. After each application the electrodes should be carefully rubbed with emery paper in order to secure an unoxidized surface for the next application. In gynecological work a current-strength of from twenty-five to forty or fifty milliampères should be used. The sittings are at the outset of fifteen, and frequently increased to thirty minutes or more. For combating hemorrhage, prolonged sittings of metallic electrolysis are more successful than strong currents of short duration. In intra-uterine treatment, applications should only be made three or four times a month, as the results are compromised and retarded by too frequent sittings. The work done by this method (copper) is one of congestion, elimination, and repair, which requires eight days to complete. This method has been used (zinc) in chronic inflammatory conditions of the uterine mucous membrane accom-

panied by induration and sclerosis; also in fibroid and keloid growths. It has also been employed in hypertrophic rhinitis, ozæna, chronic coryza, nasal polyp, sebaceous cysts, chronic urethritis, hemorrhoids and fissure, epithelioma, chancroid, and chronic conjunctivitis. Trachoma and vascular tissue also have been treated, the former by copper, the latter by iron, care being taken in this case to reverse the current, so that tearing of the tissues may be avoided. Eleven cases are reported: hypertrophic rhinitis, trachoma, urethritis, endometritis, uterine fibroids, granular and cystic degeneration of the cervix uteri, where the success has been gratifying.—*Journal of the American Medical Association*, 1894, vol. xxii. pp. 94, 129, and 116.

NEURASTHENIA IN YOUNG WOMEN.

DRS. HENRY B. DEALE AND S. S. ADAMS believe that the treatment to be successful must be directed to the improvement of the general health, with sufficient attention to any prominent local manifestation which may arise. Bathing, exercise in the open air, a designated amount of rest of mind and body, abstention from undue mental excitement, must be prescribed. The digestion must be carefully watched, the diet rigorously laid down, the insomnia combated by retiring at a regular hour and avoidance of exciting conversation and reading just prior thereto. Travelling in distant countries, riding, sometimes upon horseback, a change of climate, may all prove beneficial. The dress should be comfortable, suited to the season, and hung from the shoulders in order that pressure upon the thoracic and abdominal viscera may be avoided. It may be occasionally necessary to administer an anodyne or a cardiac stimulant, but great care must be taken that the patient is not made a hopeless inebriate. Electricity, hydrotherapy, and massage applied by the physician may be of benefit. Small blisters or the mild cautery along the spinal region sometimes yield beneficial results. Complete control over the patient must be assumed, and the rules for her daily life must be written out clearly and succinctly, and their enforcement insisted upon.—*The American Journal of Obstetrics*, 1894, No. 194, p. 190.

THE TREATMENT OF TABES DORSALIS.

DR. MAX WEISS reports a single case in which the specific treatment consisted in the use of iodide of soda in from seventy-five to one hundred and twenty grains daily. In this instance the patient had suffered from syphilis, for which he had received injections of corrosive sublimate. Within four months the marked symptoms had almost entirely disappeared. The urethral crises and weakness of the detrusor were cured by galvanization through the lumbar spinal column to the perineum and hypogastric region, together with the internal use of ergot and strychnine. In this case there were no symptoms of iodism, which in many cases is due to the impurity of the alkaline iodide—the presence of iodic acid. If for any reason the administration of the iodide cannot be *per orem*, the rectum furnishes an excellent substitute, since experiments prove that the absorption from the rectal mucous membrane is quite as rapid as from the gastric. To prevent iodism, which results from the setting free the iodine from the iodides, Ehrlich recommends the harmless sulphanilic acid in doses of sixty to ninety grains, with the addition

of forty-five to sixty grains of carbonate of soda dissolved in water, every two or three days.—*Centralblatt für die gesammte Therapie*, 1894, Heft 2, S. 65.

ATROPINE IN MORPHINISMUS.

DR. ALBRECHT ERLÉNMEYER calls attention to the plausible hypothesis of Marmé, that morphine in the body through the taking up of oxygen is changed into oxydimorphine, and it is this substance which gives rise to the symptoms of abstinence—that is to say, that the abstinence-symptoms are the result of oxydimorphine poisoning and not of morphine. Since then these symptoms are not caused by morphine, the use of atropine for their relief is not rational, and should be abandoned.—*Therapeutische Monatshefte*, 1894, Heft 1, S. 14.

CHLORALOSE POISONING.

DR. P. WATSON WILLIAMS reports a single case in which recovery took place. The patient, a highly neurotic lady of forty-two years of age, received ten grains at night suspended in milk. The next evening she again received the same dose. Within ten hours she became very excited and restless, commenced to call out. Two hours afterward she was in a state of acute delirious mania, burying her head in the pillow in abject terror, and did not recognize anyone. The pulse was unusually good, the pupils were unaffected. She forcibly resisted any attempt at restraint, and seemed acutely sensitive to the prick of a needle when a quarter of a grain of morphine was given hypodermatically, the one-sixth of a grain was given a half-hour later, which, however, did not produce any quieting effect. Six hours after the injection of the drug she apparently recovered completely, but was wholly unconscious of all that had taken place. Chloralose is said to act as a sedative to the cortex of the cerebrum, while it stimulates the medulla and spinal cord. In this case it appeared to stimulate the heart's action. In Lang's case, previously reported, there were, with similar dose, no mental symptoms beyond loss of consciousness. Ten grains is considered to be the minimum initial dose, while twenty or thirty grains is not a very large dose. Thus the bad results produced in each of the cases alluded to above, by ten grains only, will serve as a caution in its administration in cases where chloral should be considered as distinctly contra-indicated.—*The Practitioner*, 1894, No. 308, p. 98.

STRYCHNINE AS A CARDIAC AND RESPIRATORY STIMULANT.

DR. W. H. WASHBURN reports the case of a patient who had swallowed two ounces of chloroform with suicidal intent. The dilated pupils did not react to light; the respirations were exceedingly shallow, irregular, and scarcely perceptible; and he had the weak, uncertain, and irregular pulse of a dying man. One-twentieth of a grain of strychnine was injected subcutaneously and artificial respiration practised; one hour afterward one-sixtieth of a grain was injected. Complete recovery followed. It is believed that in strychnine administered hypodermatically we have a valuable remedy for the alarming symptoms which arise during surgical anæsthesia. In one instance

where recovery from chloroform anaesthesia was marked by a blanched appearance of the patient, and almost imperceptible pulse, rapid improvement followed the subcutaneous injection of one-twentieth of a grain of strychnine.—*The Therapeutic Gazette*, 1894, No. 2, p. 75.

THE TREATMENT OF GRIPPE.

DR. GINGEOT closes a very interesting paper with the following conclusions: It is necessary to seek, 1, to sustain the general strength; 2, to preserve in particular the strength of the heart; 3, to combat the local lesions produced by the infection. The stimulants, tonics, notably the *potion alcoolique* (Todd's potion), the wine of Bagnols, fulfil the first indications; caffeine and ether subcutaneously the second, and local revulsives the third. Nitroglycerin diminishes arterial tension and relieves the work of the heart muscle; the iodide of soda acts in the same way and exercises a resolving influence upon the organic alterations. The use of milk is also advisable.—*Journal des Praticiens*, 1894, No. 8, p. 85.

THE TREATMENT OF DIPHTHERIA.

DR. PAULIET claims the best results from treating the false membranes by applications of a saturated solution of papain. One-half hour afterward make an application of a liquid which is composed of equal parts of Van Swieten's liquor and glycerin. Alternate these applications every half-hour until the disappearance of the membranes.—*Bulletin Général de Thérapeutique*, 1894, 4e livr., p. 88.

PAPAIN IN ULCER OF THE STOMACH.

DR. J. F. BARBOUR reports a case in which, without warning, a teacupful of bright arterial blood was vomited; the stools were tarry for several days. One hour after eating there was experienced a violent pain in the stomach, which lasted for two or three hours. In addition, there was noted heartburn, flatulency, and constipation. A rigid diet, Carlsbad salt, subnitrate of bismuth, with morphine, nitrate of silver, gave some relief. Seeing that papain has been used to stimulate repair in indolent ulcers, it was hoped that it would also relieve the dyspeptic symptoms. It was found that an unanticipated effect was secured—the relief of pain. After three weeks the remedy was omitted and there was no return of the pain. Since this condition of ulceration may persist for two or three years, and the patient be constantly threatened with perforation, it seems that a remedy which will relieve the pain and the dyspeptic symptoms, and at the same time promote the healing of the ulcer, is a great desideratum.—*Notes on New Remedies*, 1894, No. 8, p. 113.

THE TREATMENT OF ATONY OF THE STOMACH.

DR. SAVIGNY believes that this condition is an enfeeblement of the muscular wall of the stomach, and should be distinguished from dilatation of that organ in that its capacity is not increased. Since there is no retention of food, lavage is useless. The nourishment should be substantial and yet of

small volume, and the ingestion of large quantities of fluid should be avoided. The nature of the digestive disturbance and the character of the gastric secretions must be taken into account when the choice of food is made. In all cases a milk diet should be avoided. Food slightly laxative should be resorted to, and for persistent constipation enemata of oil, or of glycerin and water, or such purgatives as cascara or rhubarb should be prescribed. For increasing the tonicity of the muscular coat nux vomica or strychnine may be resorted to; some authors even recommend ergot, the use of which should be from time to time interrupted. For the same purpose electrization, massage, and hydrotherapy may be counted among the best means at hand.—*Revue de Thérapeutique Médico-chirurgicale*, 1894, No. 2, p. 37.

THE TREATMENT OF SCURVY IN CHILDREN.

DR. G. A. SUTHERLAND considers that the preventive treatment of scurvy consists in the employment of a proper diet, and that the breast milk in the case of infants is the best and safest food. A teaspoonful of the juice of oranges, lemons, or grapes twice a day with the food is recommended. All varieties of preserved milk, along with the different proprietary infant foods, are to be absolutely forbidden. In older children a more liberal diet is allowed, attention being paid to the condition of the digestive system, but no salted or preserved foods of any kind are to be given. The more special part of the treatment in all cases consists in the free administration of fruits and vegetables, as oranges, lemons, grapes, potatoes, and cabbage. The juice of the fruit may be expressed and added to the milk in the case of infants. Potatoes and other vegetables may be conveniently administered in soup made from meat stock. In the convalescent stage cod-liver oil is of great service in restoring the general health. The local treatment is unimportant because, under proper diet, all manifestations clear up rapidly. If the gums are ulcerated and bleeding they may be painted with a solution of glycerin of tannic acid. When the limbs are swollen and tender, support and rest by means of sand-bags and the application of cold compresses will give relief. The general hygienic treatment must be attended to; sunlight and fresh air are of great value. Since fatal cardiac syncope sometimes occurs, rest in bed ought to be maintained until the patient is free from pain and breathlessness, and has been under antiscorbutic diet for some time.—*Practitioner*, 1894, No. 308, p. 81.

[In a case of scurvy in an infant seen in consultation, we advised removal to the country, fresh cow's milk properly modified, the use of the juice of oranges, and an acid preparation of iron. Complete recovery was secured within three weeks.—R. W. W.]

SALOPHEN.

DR. H. KÖSTER has found in about thirty cases of acute articular rheumatism the pains rapidly diminished, generally within four days completely disappearing after the ingestion of fifteen-grain doses. The effusion diminishes and the temperature falls, and this occurs without the appearance of unpleasant symptoms. In spite of its use in two cases other joints were invaded, and in four there was noticed an onset of pain after it had already

disappeared. In acute muscular rheumatism in a few cases favorable results were obtained. In chronic articular rheumatism the pains were lessened in some cases, but in the few cases under observation the results were generally negative. As an antipyretic it was useful, but it could not be depended upon for producing a marked depression of temperature. Better results were obtained in neuralgic and similar affections—headaches, hemicrania. In six cases of exudative pleuritis it seemed to have no marked effect upon absorption of the effusion. He concludes that, although it is a powerful remedy in acute rheumatic diseases and a useful one for neuralgias, it is not of importance as an antipyretic.—*Therapeutische Monatshefte*, 1894, Heft 1, S. 17.

THE TREATMENT OF ACUTE ARTICULAR RHEUMATISM.

DR. DUJARDIN-BEAUMETZ recognizes the fact that we have in the salicylate of soda a specific treatment for this condition, which it is necessary to distinguish from pseudo-rheumatismal manifestations and from chronic rheumatism. The former may be considered the joint manifestations of pathogenic microbes of various origins, gonococci of blennorrhœas, microbes of scarlet fever, staphylococci of purulent infection. The latter should be classed among the disorders of nutrition. Acute articular rheumatism is an infectious disease; its cyclical progress, the temperature curve, always the same. Were it contagious there would be not a doubt as to its infectious nature. Although the salicylic acid has been abandoned, for it is ordinarily not well borne by the stomach, and salicine has been rejected, yet medical opinion is in harmony in regard to salicylate of soda, not only as to dose, but that it should be administered in solution and in divided doses, according to the intensity of the disease and its resistance to the remedy. The minimum dose is one drachm; in acute cases we can exhibit twice this quantity, or even to two and one-half drachms in the twenty-four hours. Given at intervals of from two to four hours in aqueous solution, the nauseous taste can be avoided by the addition of sweetened water, or a small quantity of brandy, kirsch, or rum. For dyspeptics who do not tolerate its administration *per orem*, the rectum offers a perfect substitute, for Lemanski has shown that when given in rectal injection, it will appear in the urine in fifteen minutes. It is well to produce diuresis, and in this way to hasten its elimination. A milk diet is advisable, and when the dose exceeds two drachms it is necessary, although Paul and Labbé prefer the alkaline mineral waters of Vichy, Ponges, or Vals. When the symptoms disappear the remedy should be continued for two or three weeks in small doses, to avoid the danger of relapse. This remedy does not jugulate the disease; it masks its evolution, so that it reappears if the drug be omitted. If the treatment is commenced at the onset it prevents complications, so that we see less frequently than formerly the heart manifestations. Although it does not cure all cases, it cures the great majority, and the exception proves the rule. Certain individuals present an almost complete intolerance, either showing toxic symptoms, intestinal troubles, or cerebral symptoms, even to delirium; these symptoms may be produced by small doses even. The reason of this intolerance is well known, it is insufficient elimination, which is readily determined by treating the urine with perchloride of iron, which gives rise to a violet color if only minute traces of

salicyluric acid are present. In children and adolescents to the age of twenty, in whom renal activity is great, the drug is well borne; in old age, or in subjects who have diseased kidneys, the elimination may only take place after twenty four or forty-eight hours, and then persist for three or four days. Where the remedy has produced an abortion, the authors do not seem to have taken into consideration the fact that renal congestion is the rule in pregnant women. Therefore caution should be exercised in using the drug during pregnancy. The inconveniences of antipyrine and of exalgine are avoided in asaprol, which is a calcium monosulphonate of β -naphthol. This remedy is a soluble antiseptic, non-poisonous, which is eliminated as a sulphuric ether of naphthol, and as such is recognized by the dark-blue color which perchloride of iron gives when added to the urine in which it is present. The dose is from forty-five to one hundred and fifty grains per diem. It does not produce either dyspeptic or nervous troubles; it lowers temperature and pulse-rate. The method of administration is by means of cachets, or in aqueous solution, to which sweetened water, or anisette, or curaçoa is added at the time of taking. It appears to be the equal, if not the superior, of salicylate of soda in the rapidity in which it gives relief and cures the patient. There have been noticed no untoward results even in patients who suffer from albuminuria. The external treatment of rheumatism holds only a secondary position: wrapping the joints in cotton, the use of soothing liniments, of doubtful value. However, Bourget has strongly recommended the external application of salicylic acid according to this formula: Salicylic acid, lanolin, essence of turpentine, of each, 5; lard, 40. He declares that within half an hour after frictions have been made with this preparation the urine shows the presence of the drug. However, Ruel, for the past six years, has used salicylic acid, 2; absolute alcohol, 10; castor oil, 20, with the addition of chloroform, to facilitate the absorption of this remedy.—*Bulletin général de Thérapeutique*, 1894, livr. 2, p. 1.

M. HUCHARD reports a single case of a chronic rheumatic who had become habituated to the use of salicylate of soda, and used an old solution which had become somewhat evaporated. Each teaspoonful originally contained thirty grains of the drug, but the dose in this case was difficult to determine. Two hours afterward she complained of pain, extreme mental anxiety, violent tinnitus, and intense dyspnœa. The patient was not hysterical, nor did the urine contain albumin, although there was slight functional renal insufficiency. This patient possesses also a certain susceptibility toward other drugs.—*Revue de Thérapeutique Médico-chirurgicale*, 1894, No. 2, p. 43.

PIPERAZINE.

DR. D. D. STEWART presents an interesting paper on the influence of this drug on the urine, and especially on uric acid and urea excretion. In three cases which he reported one year ago the uric acid excretion was abnormally high and the daily fluctuations were often extensive. It was not apparent, however, that excretion of either uric acid or of urea, or even the degree of acidity of the urine, were markedly influenced by the drug in the doses administered, the average of which was a half drachm, double that previously used by most observers. The bulk of the evidence, however, at the time of

the appearance of the former paper was convincing, to the effect that this drug, although it had, *in vitro*, a markedly disintegrating effect on uric acid, with which it forms the most soluble known salt of the latter, does not actually, in the doses ordinarily administered, increase uratic excretion, however much benefit it seems to exert on cases the nature of which is dependent upon impairment of such excretion. One observation upon a patient suffering from chronic Bright's disease showed that there was actually a slight diminution, not only in the amount of urine, but in the more important urinary constituents, notably uric acid and urea. The difference is, however, too slight to be explained by any influence exerted by the drug upon the kidney. An observation made upon a patient suffering from chronic arthritis of gouty origin, and due to the deposit of urates in the joints through imperfect excretion on account of inadequate kidneys, in which very large doses were used (to seventy grains per diem), showed conclusively that the drug is practically without effect upon uric acid excretion, at least uric acid as uric acid. Apparently this drug does exert a salutary effect upon the uric acid condition; the only mode of action possible is such as has been attributed to certain of the alkalis—as vegetable acid salts of potash. The increased alkalinity of the blood these latter produce is supposed to promote its oxidation function, increasing the formation of urea, and perhaps also transforming a modicum of the uric acid by oxidation into the former, or into a second more oxidized product than uric acid, such as bodies of the alloxan or allantoin series. Though no data are at hand showing that such a transformation of uric acid into urea does take place in the organism, the fact that uric acid is so closely related to the latter tends to indicate that such a metamorphosis may occur in the human organism under favorable conditions. An investigation of the action of the drug from this standpoint may throw light upon its action, otherwise so obscure. The urea formed from a portion of the uric acid would, of course, be in such small quantity as to be practically unrecognized by quantitative tests because of the normal daily variation. The detection of the presence of allantoin or alloxan in any quantity in the urine under the use of this drug could be more easily interpreted. Untoward effects have been noticed when large doses have been given; feelings of nervousness and apprehension, intermittent clonic spasms of the upper extremities, spreading to the muscles of the abdomen and legs, the patient became dazed, unable to think clearly, for some hours partly unconscious, muscular prostration with incoördination, coarse tremors, uncertainty of gait for several days, due rather to impairment of coördination than to any parietic condition of the muscles. Since untoward symptoms were caused by drugs from different manufacturers, it is evident that the toxic principle exists in the drug, though not to the same extent in equal amounts. Witt-nack believes that the hygroscopic property of the remedy must be borne in mind, less disappointment attend its use, and states that some samples may contain as much as 50 per cent. of water. For this reason he recommends salts of piperazine rather than the base, as the more stable.—*Therapeutic Gazette*, 1894, No. 2, p. 86.

DR. BLANC has carefully reviewed the literature of this remedy, which it was hoped would cure gouty affections more surely than colchicin and more rapidly than lithia. The latter can be used only in small doses, because it

rapidly exhausts the kidneys and disturbs digestion, therefore it is a slow treatment, and it is not exempt from inconveniences. Theoretically the use of piperazine is very encouraging. An alkaloid of the pyridine group, it is not poisonous nor irritant; it is very soluble in water, even deliquescent. The combination of urate of soda and this drug is nearly nine times more soluble than the urate of lithia. In daily doses of from fifteen to forty-five grains it is without marked effects, unless it have a diuretic one. Vogt has found that under fifteen-grain daily doses the amount of urates is decreased, while that of urea increases. This goes to show that not only does this drug dissolve urates, but it is an oxidizing agent and modifies tissue change. On the other hand, the nitrogen which is eliminated is not increased, which shows that there is no increase of waste nor supplementary decomposition of albuminoids. The piperazine is excreted, undecomposed, by the kidneys. If used hypodermatically it causes acute pain and an infiltration more or less marked, and sometimes an abscess. It has been strongly recommended for gout, in that it relieves the pain, frees the engorged joints, and expels renal calculi. Patients who have suffered from nephritic colic, some days after the use of the drug experience a recrudescence of the pain, which is followed by the expulsion of a large calculus, which has apparently been diminished in size by the action of the drug. In this respect it appears to act with less danger than do the alkalies, and more rapidly than the flushing out of the kidneys with Vittel or Contréxeville waters. On the other hand, relief is sometimes slow in appearing, and colchicin when properly used is far more rapid; and further, piperazine is sometimes without effect. It is believed that the drug should be used, especially when others have failed, in from fifteen to thirty grains *per diem*, dissolved in a carbonated water, taken in two doses, fasting if possible.—*Revue de Thérapeutique Médico-chirurgicale*, 1894, No. 3, p. 74.

THE CRESOLS: TRICRESOL.

DR. OSCAR LIEBREICH presents this drug as an agent for disinfection for surgical and hygienic purposes. Taking the formula of carbolic acid as phenol, that is, a benzol in which a hydrogen atom is replaced by a hydroxyl group (HO), it is possible to have three isomeric bodies in which the hydrogen atom, which is replaced by the methyl group (CH_3), is more or less farther removed. These isomers may be designated ortho-, meta-, and para-cresol. A mixture of these three chemically pure bodies has been named tricresol. The value of carbolic acid as a disinfectant depends upon its percentage of the contained cresols. Recognizing the fact that creolin, solveol, and lysol owe their value as disinfecting properties to the cresols which they contain in varying proportions, it is also evident that they have limitations in the amount of cresols which they may contain, and as well there may be dangerous symptoms produced by their impurities. The pure cresols are soluble at ordinary temperature in water from 2 to 2½ per cent, and are used in from ½ to 2 per cent. solutions for medicinal purposes. These new products are undoubtedly a great advance, and it is quite likely that from tricresol a series of preparations may be made which will be of great value.—*Therapeutische Monatshefte*, 1894, Heft 1, S. 25.

MEDICINE.

UNDER THE CHARGE OF

W. PASTEUR, M.D. LOND., F.R.C.P.,

ASSISTANT PHYSICIAN TO THE MIDDLESEX HOSPITAL; PHYSICIAN TO THE NORTHEASTERN
HOSPITAL FOR CHILDREN;

AND

SOLOMON SOLIS-COHEN, A.M., M.D.,

PROFESSOR OF CLINICAL MEDICINE AND APPLIED THERAPEUTICS IN THE PHILADELPHIA
POLYCLINIC; PHYSICIAN TO THE PHILADELPHIA HOSPITAL.

THE DIAGNOSTIC VALUE OF THE DIAZO REACTION (EHRlich).

As a result of the systematic examination of 227 cases, of various nature, admitted into the Cork-Street Hospital, Dublin, DR. W. R. DAWSON arrives at the following conclusions as to the value of Ehrlich's test:

"1. That the diazo reaction is found in the great majority of cases of enteric fever at some period between the fifth and twenty-first days, and is more constant in that disease than in any other (of those tested) except measles, and, perhaps, acute phthisis, so that, with these reservations, its presence affords a presumption in favor of, its absence a much stronger presumption against, such a diagnosis.

"2. That the reaction cannot be used either positively or negatively to distinguish enteric fever from phthisis or measles, and that the presumption which it affords against typhus is small.

"3. That it is nearly or quite constant in measles, but absent in at least many cases of r  theln, and may, consequently, be used to distinguish between them.

"4. That the substance causing it does not indicate its presence by any peculiarity in the color, odor, deposit, reaction, or specific gravity of the urine, nor by the presence of albumin, sugar, or indican, although their concurrence is not uncommon.

"That it is not due to free acetone, nor to a direct product of the bacillus typhosus of Eberth."—*Dublin Medical Journal*, No. 258.

ALBUMINURIC ULCERATION OF THE BOWELS.

BEFORE the Medical and Chirurgical Society of London DR. W. H. DICKINSON has lately summarized his experience of twenty-two examples of this condition. The subject was referred to in his Croonian Lectures in 1876. In all the cases ulceration of the bowel was coincident with, and presumably pathologically connected with, renal disease. Eight instances are appended as of collateral interest, in which, under similar circumstances of renal disease, the bowel was the seat of hemorrhagic extravasation without ulceration.

The ulcers were not confined to any one part of the bowel, though most frequent in the lower part of the ileum, nor were they especially associated with any of the glandular structures. The most marked character of the

ulcers was their association with hemorrhage; recent extravasation, and pigmentation the result of extravasation, were frequently to be seen in their neighborhood, and in three cases where the specimens were subjected to microscopic investigation blood in various states of alteration was found in the submucous tissue in connection with the lesion. Two cases are adduced in which the stomach was ulcerated as well as the bowel, in one the ulceration being associated, as in the bowel, with extravasation of blood.

In the twenty-two cases of intestinal ulceration upon which the paper is based, the kidneys were diseased in all; in fourteen they were granular, in two large white. In nineteen of the cases hypertrophy of the heart was noted; in nine there was retinal hemorrhage or exudation. Thus the albuminuric ulcer presents itself in company with other members of the cardiovascular series to which it apparently belongs.

The lesion mostly presents itself late in the course of the renal disease, and often brings about the fatal issue by means of peritonitis and perforation. The symptoms commonly present are griping, abdominal tenderness, diarrhoea, and vomiting. In a minority of cases no symptoms are to be observed.

DR. HALE WHITE observed that in a series of twelve cases of ulcerative colitis four of the patients had granular contracted kidneys. He agreed that peritonitis was more common than perforation.

The disease under discussion was evidently one form of the disease described as ulcerative colitis. He differed from the author in believing that ulceration was caused by inflammation in these cases, rather than by hemorrhage, which latter might be evidence of the severity of the ulceration.

TRICUSPID STENOSIS.

DR. E. H. COLBECK discusses in the *Medical Chronicle* (vol. xviii., No. 5) the above affection at some length, and appends full notes of seven cases in which it occurred, and in five of which it was diagnosticated during life. The symptoms were fairly constant; dropsy in varying degree in every case, and generally extreme cyanosis of the face and extremities; general venous distention; dyspnoea in every case; palpitation, associated with infra-mammary or epigastric pain.

After referring to the rare event of dropsy in uncomplicated mitral stenosis, the writer observes that the occurrence of dropsy when tricuspid stenosis is superadded may be explained by the partial relief of the pulmonary engorgement at the expense of an increased distention of the systemic veins.

Right-sided dilatation and hypertrophy (mainly auricular) is nearly always present; the dulness is best appreciated in the third, fourth, and fifth right interspaces.

The auscultatory signs are often most conclusive. In five out of seven cases a presystolic or diastolic murmur was heard more or less clearly over the tricuspid area, by which is understood the fourth and fifth left intercostal spaces close to the sternum and the area around the ensiform cartilage.

The murmur was very inconstant in all the cases, and is, therefore, likely to be overlooked unless repeated auscultation be practised. A tricuspid regurgitant murmur is also usually present, but usually follows the right heart first sound, which is short, sharp, and loud. The jugular veins are usually

full, and there may be some pulsation. This, however, is usually absent and the veins do not fill from below up. The liver is often greatly enlarged but does not pulsate.

The important diagnostic points are summarized as follows :

"1. Dropsy, well marked in all cases, and usually extreme. 2. Extension of the area of cardiac dulness to the right of the sternum, associated with epigastric pulsation and a forcible right heart impulse. 3. A presystolic or diastolic murmur audible over the tricuspid area. 4. A short, sharp, and loud right-heart first sound, not obscured by the systolic murmur if it be present. 5. Fulness of the jugular veins not accompanied, as a rule, by pulsation. General venous distention, associated with cyanosis or lividity of the face and extremities."

The article concludes with the consideration of the pathology and prognosis of the affection. He adopts the view that the tricuspid stenosis is secondary to and caused by the stenosis of the mitral valve. Its occurrence greatly increases the gravity of the prognosis.

THE GASES OF THE STOMACH.

A REVIEW of the more recent investigations into the composition of the gases of the stomach leads DR. McNAUGHT, of Newchurch, to the following conclusions :

"1. That the formation of H and sometimes marsh-gas in the stomach is much commoner than was formerly supposed. 2. That its production is the result of retention of the food, usually in a dilated stomach, but stenosis of the pylorus without dilatation may cause it. 3. Stenosis of the pylorus is the commonest cause, but stenosis of the duodenum has been found in three cases. 4. That H preponderates in cases of non-malignant stenosis, in which there is an excess of HCl secreted. 5. That in stenosis of carcinoma the gas consists chiefly of CO₂. 6. That SH₂ may also be produced in a stomach whose secretion contains a normal quantity of HCl, if retention of the food from any cause exists. 7. That certain cases of flatulency are undoubtedly due to swallowed air. 8. That the most efficient antiseptic agent is salicylic acid or salicylate of sodium."—*Medical Chronicle*, vol. xix., No. 2.

CALCIUM CHLORIDE AS A HÆMOSTATIC.

DR. SAUNDBY (Birmingham) records cases of rectal hemorrhage and purpura hæmorrhagica in which five six-grain doses of chloride of lime arrested hemorrhage after other measures had failed.—*Birmingham Medical Review*, No. 182.

LESION OF CAUDA EQUINA; RELIEF OF SYMPTOMS BY OPERATION.

DR. J. E. SHAW and MR. PAUL BUSH, of Bristol, record the following case: Patient aged thirty years, bootmaker, was admitted to hospital complaining of weakness, pain, and loss of sensation in legs and loss of control over anal and vesical sphincters. He dates his illness from a strain of the lower part of the back during a struggle eleven years ago, but for two or three years

before that had experienced slight dull pains in popliteal spaces and outer sides of thighs and legs.

The accident was shortly followed by gnawing pains in back of thighs, accompanied later by pain and tenderness over lower end of spine. Progressive weakness of the legs began within two months. For two years has been unable to walk without a stick. Anæsthesia began about same time, and he believes spread downward from the back of the thighs. Within three months of accident there was loss of control over rectum. Last four years has used an enema every second day. Frequent micturition with pain, eventuating in incontinence, began within eight months of onset. Catheterism practised for four years.

Of late years has had painful spasms of hamstring muscles. There have been nocturnal emissions, with sensation, about once a month since onset; of late, occasionally by day. For two years has had an ulcerated corn on ball of great toe.

State on admission. Unhealthy looking; usually lies on right side with legs drawn up. The fourth or fifth lumbar spine is somewhat prominent, and at that point, and for a short distance below, there is tenderness on percussion and on the application of a hot test-tube or sponge. *Reflexes:* Right knee-jerk, normal; left, slightly exaggerated. Neither patellar nor ankle clonus obtainable. Plantar reflex absent on both sides; the cremasteric present, and the abdominal and epigastric exaggerated.

Legs are weak; scarcely lifts them from ground in walking; left weaker than right. Diminished excitability and reaction of degeneration in hamstring, peroneal, calf, and tibial muscles. Occasional fibrillary tremors in affected muscles. Total anæsthesia of skin over coccyx and around anus; to a less degree over nates, back, and inner sides of thighs, popliteal spaces, calves, lower parts of the fronts of the legs; to a slight degree on the outer side of the left leg, and the entire feet except upon the inner side of each foot. Different forms of sensibility about equally affected. Urethra completely anæsthetic, but testes sensitive. Rectal mucous membrane also anæsthetic.

Suffers from intense darting pains in back of thighs and legs, requiring morphine hypodermatics every three hours.

Laminectomy was performed by Mr. Paul Bush about a month after admission. After dissecting off muscles and fasciæ on each side of the spinous processes a swelling was exposed situated in the middle line; this was freely incised, when a rounded cavity, covered in with a thin shell of bone some three inches across, came into view. The spine of the fourth lumbar vertebra was found to be pushed backward; this was removed, together with the laminæ on either side, by means of the bone-forceps. The fifth lumbar spine and laminæ appeared to have been entirely absorbed; the cavity, which was evidently the dilated spinal canal, contained a solid mass, which was removed, some hemorrhage occurring. The nerves forming the cauda equina at this position could not be clearly defined, as they were pressed forward against the posterior surface of the bodies of the vertebræ, and covered over by strong fibrous tissue. In removing this mass it was torn into several pieces, one of these fragments being as large as an ordinary orange.

Four days after operation one hypodermatic daily sufficed to keep pain

under. Two months after there was an appreciable recovery of sensibility all over the affected areas, and pain continued to diminish. On examination the mass removed from the spinal canal showed well-organized blood-clot, with some fibrous tissue, but no other distinctive structure.—*Bristol Med.-Chir. Journal*, vol. xi., No. 41.

HEMIANÆSTHESIA AND ATAXY FROM LESION OF PONS VAROLII.

DR. H. H. BROWN (Ipswich) reports as follows: A woman, aged twenty-four years, suddenly felt faint and fell without loss of consciousness. There was no history of cardiac or renal disease. Next day there was complete paralysis of right side of face to all stimuli. Pupils contracted. Eyes could not be moved to right beyond the middle line. Sensation was wanting over left side of body and face. Left plantar reflex absent. Some difficulty in swallowing and articulation. No motor paralysis of limbs. Knee-jerks both normal. Temperature 100° F.; pulse 90, regular. Respiration normal. Left conjunctival reflex present, not the right. Next day sensation returned to some extent over face, but still almost entirely absent over left side of body. Internal strabismus of right eye.

Condition grew worse during next few days. Temperature and pulse rose. Patient was drowsy and complained of pain in head, left arm, and breast. Speech became quite unintelligible and deglutition difficult. Tongue deviated to the right for a few days. Febrile symptoms disappeared after a week and the patient recovered the ground she had lost. Tactile and painful sensation was still absent on the left side, and muscular sense also appeared to be quite absent. She was now able to walk with assistance, but very unsteadily, and leaned much toward the right side; unable to stand alone. She afterward became able to walk by the aid of a stick. Sensation gradually returned but remained much impaired, especially in the left hand.

"The diplopia ceased to be noticeable, and there was some power of movement of the left eye inward, though the paralysis of the external rectus of the right eye remained. Muscular sense improved, so that she became able to tell the position of her limbs and to hold an object in the left hand with the eyes closed; but there was always great ataxy in all movements of the left hand, and she was unable to pick up a small object such as a pin without great difficulty. The left arm and leg were always blue, cold, and congested when the weather had been at all cold, and she experienced great difficulty in keeping the left hand warm, which also showed a tendency to chilblains. There was a very troublesome ulceration of the right cornea, which continued for many weeks in spite of careful treatment and was accompanied by iritis."

Fifteen months after the onset the general health was good. Walked alone with a stick, but very unsteadily. Sensation present everywhere, but very deficient over left hand, where prick of a pin cannot be localized and is delayed when felt. Heat and cold cannot be distinguished on left side of body. Tactile sense absent in left hand and very imperfect over arm and leg. Internal strabismus of right eye continues; pupils normal in size and reaction. Facial paralysis remains absolute, and right facial muscles do not respond to faradism. Knee-jerks equal and normal. No ankle clonus. Slight plantar reflex now on left side. No paralysis of soft palate.

The nature of the lesion is not clear, though the diagnosis of its situation presents no difficulty.

"The paralysis of the external oblique muscle of the right eye points to a lesion involving the sixth nerve or its nucleus on this side. Since the internal strabismus of the right eye was accompanied by a loss of power of movement of the left eye toward the right, it is clear that the nucleus of the sixth nerve, and not the nerve alone, is affected, for it is only in cases in which a lesion involves the nucleus that complete paralysis of the external rectus leading to internal strabismus is accompanied by loss of the conjugate movement of the other eye. The nucleus of the sixth nerve is connected with that of the third nerve on the other side by means of the posterior longitudinal bundle. The facial paralysis on the right side is total for all kinds of movement—volitional, emotional, and reflex—and is accompanied by degeneration of the facial nerve, as evidenced by the absence of response to faradism. It is clear, therefore, that the paralysis is due to a lesion of the nerve itself or of its nucleus in the pons. The fact that the orbicularis oris muscle is paralyzed indicates that the lesion involves the nerve and not its nucleus only, for it appears that that muscle derives its nerve-supply from fibres which arise at the hypoglossal nucleus but run in the course of the facial nerve. A single lesion involving the facial nerve and the nucleus of the sixth nerve can only be situated in the lower part of the pons. In this situation the facial nerve loops closely around the nucleus of the sixth nerve, so that a gross lesion, such as embolism or hemorrhage, which destroyed the one, could not fail to destroy the other.

"It is supposed that impulses of muscular sense are conveyed in the tract of the fillet; if this is so, the lesion must have extended as far forward as that tract, which lies at the anterior part of the reticular formation. It is obviously a small lesion, since it does not spread in the slightest degree inward beyond the middle line, nor outward as far as the fifth nerve, the ascending root of which is situated immediately outside the seventh nerve in the descending part of its course."

The lesion may have been due to the sudden thrombosis of a small vessel.—*Lancet*, No. 3667.

SENSORY DISSOCIATION FOLLOWING A LESION OF THE BRACHIAL PLEXUS.

VERHOOGEN (*Journal de Médecine, de Chirurgie, et de Pharmacologie*, 1894, No. 5, p. 65) has reported the case of a man who was thrown from a bicycle upon the right side of his body, suffering a subglenoid dislocation of the head of the humerus, together with loss of power, cyanosis, and depression of the temperature of the extremity, and loss of the radial pulse. The luxation was readily reduced and the symptoms disappeared, with the exception of the loss of power. Electric examination made several days afterward disclosed the persistence of absolute palsy in the affected member, the supinator longus alone contracting upon active stimulation. All forms of sensibility were slightly impaired upon the arm. In the cutaneous distribution of the circumflex nerve, however, sensibility was entirely lost; while shooting pains followed the course of the ulnar nerve. The most striking feature was a loss of the muscular sense and of the sense of position of the member, so that the patient felt as though he had lost his arm. There was also begin-

ning muscular atrophy, but no cedema and no cyanosis. The atrophy progressed and the muscles presented quantitative electric changes. The treatment consisted solely in the application of galvanism. Shortly the muscular sense began to reappear and gradually the muscles increased in size, and sensibility returned. The application of a blister to the shoulder was followed by a disappearance of the pain, and voluntary movements were in a little while resumed. Improvement thus gradually progressed, although a slight impairment of sensibility in the course of the ulnar nerve persisted, and perfect power was not regained in the arm. It is believed that as a result of the dislocation the brachial plexus and the vessels were subjected to compression by the head of the humerus. It is considered unlikely that there are distinct centripetal nerve-fibres for the conduction of the several forms of sensibility, but it is surmised that the same fibres act as the conductors of all, and that under certain unusual conditions the axis-cylinders may retain their power of conducting certain sensations, although they had lost the power of transmitting others, different qualitatively or quantitatively.

AN ATYPICAL NEUROSIS.

BAUER (*Berliner klin. Wochenschrift*, 1894, No. 5, p. 113) reports the case of a boy, thirteen years old, the son of a neurotic father, and who, at all times excitable and susceptible to slight influences, displayed from time to time outbursts of anger approaching in character actual mania. On one occasion the boy almost caused the death of a comrade. At other times, and when there was neither occasion nor opportunity to vent his feelings, the child would for hours remain uncommunicative and preoccupied. At times there would be a period of restlessness followed by a passionate outburst, like the aura of an epileptic attack. The peculiarity of the case resided in paroxysmal attacks of hyperæsthesia of the right foot. The sensitiveness was so acute that the slightest touch was sufficient to threaten a convulsive seizure. The first attack set in abruptly, without premonitory symptom. It persisted for seventeen days without variation in intensity, and subsided with the same suddenness with which it had begun. After an interval of six weeks a second attack just like the first took place, involving the same parts, marked by the same intensity, and having the same duration. Milder attacks of similar character recurred thereafter from time to time. All were characterized by suddenness of onset and termination, and lasted from twelve to twenty-six days, being succeeded by a free interval of varying duration. In most instances the local manifestations consisted of increased warmth, relieved by exposure to cold. There was no spontaneous pain, but exquisite sensitiveness to even the slightest touch. Exceptionally there was cedematous, colorless swelling, and on two occasions erythematous macular redness of the skin of the affected part. As a rule, these manifestations alternated between symmetric parts of the feet. On one occasion the side of the neck in the distribution of the spinal accessory nerve was affected. Shortly after this last occurrence, complete loss of hearing in both ears set in suddenly, lasting for thirteen months, and disappearing with equal suddenness. During the continuance of the deafness the local manifestations remained in abeyance. After the hearing had been restored two further

paroxysms occurred, in the latter of which the hyperæsthesia extended without intermission to the left foot, disappearing from both in the course of a few days. Now, for the first time, a feeling of weakness and uncertainty remained in both feet. Throughout the whole period of observation the general health had been conserved. Sleep was undisturbed; the appetite was good; the bowels moved regularly; growth progressed satisfactorily. The irritability remained excessive, but was not so marked as it had been. The opinion is expressed that the case belongs more properly in the category of erythromelalgia than in any other.

A CASE OF ADDISON'S DISEASE, WITH RECOVERY.

AT a recent meeting of the Berlin Society for Internal Medicine, NEUMANN (*Deutsche med. Wochenschrift*, 1894, No. 5, p. 105) presented a man, fifty-seven years old, in whose case a diagnosis of Addison's disease had been made by competent authority, but who had been free from symptoms of the disease for a number of years. There was nothing noteworthy in the family history. Syphilis and alcoholic excess were denied on the part of the patient. He had had relapsing fever at the age of thirty-seven and typhus fever at the age of forty-three. When forty-nine years old, marked asthenia rather abruptly made its appearance and continued with progressive intensity. The man came under observation after having fallen unconscious on the street. At the time sleep was disturbed, breathing was difficult, and slight cough was present. The general nutrition was fairly well preserved, but the skin generally presented a reddish-brown discoloration, resembling the hue of an Indian, or of coppery bronze. Upon the face and the upper and lower extremities the color was rather of a yellowish-brown, while upon the trunk it was darker, and particularly so upon the neck, the lateral aspect of the thorax, the abdomen, the flexures of the knees, the sacral region, and the anal folds. The color was not especially marked upon the nipples and the genitalia. The conjunctiva was pale and not discolored. The lips and the mucous membrane of the cheeks, and in less degree the hard palate, presented bluish-black punctation, but otherwise appeared intensely anæmic. The soft palate and the pharynx displayed no change in color. A soft systolic murmur could be heard at the left base, and a loud hum in the veins of the neck. No noteworthy abnormality was detected in the lungs, liver, spleen, or kidneys. The physical weakness was extreme. Sensibility was not deranged. Tremor was present, associated with a feeling of chilliness and aggravated by intended movement. Improvement was exceedingly slow and interrupted. More than two years elapsed before the patient was able to get about in his usual way, and it was some months later before he was able to resume his occupation as a coal-carrier, and then not with the same degree of vigor as before. The intention-tremor never entirely disappeared, and was intensified by intercurrent disease. At no time, however, had there been spasm, atrophy, or ataxia. The tendon-reflexes generally were, and remained, exaggerated. The special senses displayed no abnormality and the fundus oculi presented no unusual pigmentation. For a time there was pain below the level of the false ribs on either side. As the anæmia subsided the basic systolic murmur and the hum in the neck dis-

appeared. For a time the urine contained an undue amount of indican. Subsequently to his recovery the man had successively an attack of pneumonia involving the lower lobe of the left lung, an attack of influenza, an attack of supra-orbital neuralgia, a second attack of influenza, an attack of sciatica, and finally a third attack of influenza. Numerous examinations of the blood were made and the number of red cells was found to vary between 1,180,000 as the minimum, and 7,700,000 as the maximum, without increase in the number of colorless cells. The maximum was reached long before recovery had set in and a return to the normal number had taken place. This is construed to indicate the occurrence of a regenerative hyperplasia of the red blood-corpuscles comparable to that which takes place after loss of blood by hemorrhage, as well as in the course of other diseases attended with blood-disorganization.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE
UNIVERSITY AND GERMAN HOSPITALS;

ASSISTED BY

ALFRED C. WOOD, M.D., AND C. L. LEONARD, M.D.,

INSTRUCTOR IN CLINICAL SURGERY, UNIVERSITY ASSISTANT INSTRUCTOR IN CLINICAL SUR-
OF PENNSYLVANIA; ASSISTANT SURGEON, GERY IN THE UNIVERSITY OF
UNIVERSITY HOSPITAL. PENNSYLVANIA.

CONTRIBUTION TO THE STUDY OF ANAL TUBERCULOSIS.

HARTMANN contributes an exhaustive article (*Revue de Chirurgie*, 1894, No. 1) on this subject. He states that tuberculous fistulæ in the region of the anus may originate in neighboring organs, as the prostate, adjacent bones, etc. There is also a variety of peri-anal subcutaneous tuberculous gumma which corresponds to those found in other regions. With these the author does not concern himself. Particular attention is called, however, to a form of tuberculous ulceration peculiar to this region, and which appears at the muco-cutaneous margin of the anus, usually just within the canal, and results in the formation of a fistula. The relation of anal fistulæ to pulmonary consumption is of interest. In 626 phthisical patients the author found and operated upon 31 fistulæ. The proportion was 6 per cent. in men and 3.5 per cent. in women. In 48 cases upon which the author operated for fistulæ, undeniable signs of pulmonary tuberculosis were found 23 times; 2 other patients gave a tubercular family history; while in 23 cases the patients seemed to be free from tuberculous trouble. Of 114 cases of diarrhœa in phthisical patients, 8 were found to have fistulæ, a proportion a little larger than that found in all tuberculous cases. In only 1 case in the 48 patients operated upon did the diarrhœa continue after operation.

Having established the connection between phthisis and these fistulæ it does not follow that all fistulæ in phthisical patients are tuberculous. The author does not accept the view that anal fistulæ in phthisical patients begin as abscesses, but states that they usually originate in the anus.

Although the fistulæ may extend high up the rectum the internal orifice will be found near the sphincter. In 41 cases the rectal mucous membrane was carefully examined at the time of anæsthesia and after dilating the anus, and only twice was ulceration in the rectum proper found, which could possibly be tuberculous. Nor have any ulcers been found in connection with abscesses. Therefore the theory that these fistulæ are due to tuberculous ulcers has not been confirmed in the author's experience.

Of 10 suppurating cases, tubercle bacilli were found in 6; in 1 case the tubercle bacilli were associated with streptococci and staphylococci pyogenes aureus, and in 5 the bacterium coli was found. In some cases there were no evidences of any other tuberculous lesion. It appeared, therefore, that the anal lesion was primary. Hartmann concluded that the tuberculous abscesses of the anus result from local inoculation of a superficial excoriation by tubercle bacilli in the feces. It is at the region of the sphincter that these abrasions exist, hence the abscesses at this point.

Operation has been objected to by some authors on the ground that the wound would not heal, and that if it did a useful outlet would be suppressed. Both of these premises are incorrect. In regard to the fear of generalization after the operation the author states that in 154 operations in the Hôpital Bichat during the last few years, in not one has there been generalization of the disease.

The following considerations refer to muco-cutaneous ulceration at the margin of the anus:

Etiology. Of 29 cases observed, 22 were in men, 6 in women, and 1 in a child. Diarrhœa is more frequent than in fistulæ; this was noted in 12 cases and probably occurs more frequently than has been supposed. Only 3 of these patients suffered from hemorrhoids. One had a previous fistula, and one an eczematous eruption. All of the patients had pulmonary lesions, some far advanced.

Symptoms. At the beginning of the ulceration there have been no definite symptoms, merely a little uneasiness or discomfort at defecation. There is a tendency for the ulceration to extend upward on the mucous membrane—an ulceration of the anal canal proper. The pain is very variable and the course of the ulceration is slow.

Treatment. As these cases are usually complicated with intestinal and pulmonary lesions general treatment is always necessary. Locally, silver nitrate, long persisted in, may be of some benefit. The galvano- or thermo-cautery may also at times be indicated, but usually the bistoury will be required. Frequently it is best to cut away the ulcer and cauterize the base. The wound should be packed with iodoform gauze. In this way permanent cures may be looked for.

THE TREATMENT OF LUPUS VULGARIS.

In a contribution on this subject, SCHUETZ (*Archiv für Dermatologie und Syphilis*, 1894, No. 1) recognizes the fact that there are forms of lupus in

which all methods of treatment are useless. In other cases, especially in those where there are isolated spots of disease, doubt can scarcely exist that the radical excision extended into healthy tissue is the only rational method of treatment. For the relatively frequent condition of extensive lupus ulceration of the skin of the face, the method of excision with skin-grafting by Thiersch's method is open to objections, and does not always give good results. In these cases he has obtained very favorable and lasting results by the following treatment: The lesions are subjected to the most energetic scraping, after which the surface of the wound is thoroughly scarified, the scarification being carried a distance of about one centimetre on the surrounding healthy tissue in order to reach any outlying foci. After hemorrhage is arrested the raw surface is repeatedly brushed with a cold alcoholic solution of zinc chloride to which sufficient hydrochloric acid has been added to keep the mixture clear. Severe pain follows this application, lasting about six hours. It may be relieved by ice compresses, after which compresses of boric acid water are applied for one or two days. After this, pyrogallic vaseline (1 : 4), which is to be changed three times a day for four days, is applied. The local use of the boric water is again resumed for four days, when the pyrogallic ointment is applied as before for four days. Then the boric water for three days, and the pyrogallic application for three days again. Finally, healing may be encouraged under mercurial plaster, iodoform, or boric acid salve; the author especially recommends the use of mercurial plaster, collodion, and a pressure bandage. Healing is said to be relatively quick, and to be followed by a good cosmetic effect. The basis of this method is the effort to reach the most minute points of disease which lie in the surrounding healthy tissue. It is impossible to guarantee against a recurrence, but for the best results the operation should be performed early. The danger of miliary tuberculosis is said to be no greater than would follow any other surgical proceeding, but whether the frequent application of the pyrogallic acid on an open wound is without danger is left an open question. Thus far the author has observed no ill effects from its employment. In the present state of our knowledge the author claims the best results will follow the combination of energetic surgical and chemical treatment.

CONTUSION AND RUPTURE OF THE ILEUM WITHOUT EXTERNAL WOUND;
CÆLIOTOMY; RECOVERY.

WIGGIN (*New York Medical Journal*, vol. lix., No. 3) reports the following case: A. M., fifteen years of age, colored, was kicked in the right lumbar region by a horse; in a few minutes nausea and vomiting followed. An examination of the patient, the evening of the injury, showed evidences of beginning peritonitis. There was no mark of external violence. The treatment consisted in the use of morphine hypodermatically, fluid extract of ergot by the mouth, and an ice-bag on the abdomen. Twenty-four hours later the signs of peritonitis were plainly visible. Cœliotomy was decided upon. A four-inch incision was made in the median line between the umbilicus and the pubis, and the cæcum sought for. When this was found the small intestine was drawn out of the wound and examined inch by inch. It was somewhat distended, and presented a fibrinous exudation with slight

adhesion. At one point a pronounced ecchymosis was discovered near the mesenteric attachment. This was passed, however, and higher up a knuckle of ileum was found so dark in color that the restoration of its vitality seemed impossible. Accordingly about six inches of this portion of the intestine was resected, including the discolored portion. Safety-pins were used for clamps, the mesenteric vessels were separately ligated, and the cut margin united by a continuous suture. The ends of the ileum were brought together and united by Maunsell's method, except that the margins of the wounds were not painted with Woelfler's solution, nor was the iodoform employed. Before the union had been made the patient partially recovered from the ether, and on account of straining and efforts at vomiting, a quantity of blood and fecal matter escaped into the peritoneal cavity. This accident was attributed to the large size of the safety-pins. To disinfect the parts a large quantity of a fifteen-volume solution of hydrogen dioxide was poured into the cavity and allowed to remain during the completion of the operation. Finally, the cavity was flushed with normal sterilized salt solution, and as much allowed to remain as the cavity would contain. The external wound was closed without drainage. Recovery followed promptly, and by the ninth day the patient was allowed his usual diet. The points of interest to which the author calls attention are the following:

1. Hemorrhage, which in recorded cases, successful and unsuccessful, occurred only once (Croft's case), and this was very slight.

2. The slight amount of shock when the patient was first seen, four hours after the accident, the temperature and pulse being normal.

3. The excision of the contused and perforated portion of the ileum, and the end-to-end union by Maunsell's method, which is comparatively new and has not been employed many times.

4. The use of hydrogen dioxide in full medicinal strength for the purpose of disinfecting the general peritoneal cavity, this being the second successful case in which it has been used.

5. The closing of the abdominal wound leaving the peritoneal cavity full of hot sterilized salt solution, the object of this being to lessen adhesions, to lessen the danger of septic peritonitis, and to aid by osmosis the action of the intestine.

6. The shorter duration of the operation.

7. In the after-treatment the early administration of peptonized food (twenty-two and a half hours).

From a careful study of recorded cases the failure of surgical measures is shown to be due to:

1. Delay, which has been responsible for the largest number of deaths.

2. Hemorrhage.

3. Failure of the suture and septic peritonitis.

Delay in the future will be obviated by a better understanding of the early symptoms by the general practitioner. The important factors in the diagnosis are the history of injury, persistent nausea, hemorrhage, prolonged shock, rise of temperature, increasing rapidity and weakness of the pulse, increased frequency of respiration, rigidity of the abdominal muscles, persistent pain with or without pressure, and the facial expression. Hemorrhage after operation is to be avoided by greater care in tying the mesenteric

vessels, which should be ligated singly and not *en masse*. Failure of the suture will be less common with improved technique, as by Maunsell's method, septic peritonitis will be obviated by the liberal use of hydrogen dioxide, if infection is known to exist, and leaving the abdominal cavity full of hot sterilized salt solution. The author also calls attention to the importance of having an experienced and competent anæsthetizer.

CONCERNING THE ALTERATION IN THE LENGTH OF THE LOWER EXTREMITY IN DISLOCATION OF THE HIP-JOINT.

RIEDINGER (*Deutsche Zeitschrift für Chirurgie*, Bd. xxxvi., S. 102) states that the methods usually employed in determining the amount of lengthening or shortening of the limbs in cases of hip-joint dislocations give erroneous results. He claims that the measurement taken from the anterior superior spine of the ilium will show less alteration than if the measurement be taken from the middle line of the body. It is recommended, therefore, in such cases to take the measurement from the symphysis pubis. The comparative measurements are given in four cases. One of these was a perineal and another an obturator luxation. In these, measurements from the spine indicated shortening, but when taken from the symphysis a lengthening was shown as compared with the sound side.

THE ETIOLOGY OF CHRONIC HERNIA, WITH ESPECIAL REFERENCE TO THE OPERATION FOR RADICAL CURE.

BISHOP (*Lancet*, 1894, vol. i., No. 6), in an interesting article, shows by quotations from a number of eminent authorities the frequent failures that follow the operation of so called radical cure. The author formulates the prevailing ideas as follows:

1. Hernia is a protrusion of viscera from their normal plane, through the walls which ordinarily contain them.
2. That viscera that are normal, contained within walls of normal strength, do not protrude.
3. If viscera protrude, such a condition is due to (a) an inordinate strength of their attachments (the mesentery); (b) an abnormal attachment of the mesentery to the back of the abdomen (Lockwood); (c) constitutional weakness of the walls and abnormal patulousness of the normal orifices (Mitchell Banks); (d) effects of injuries, operations, sudden strains in lifting, etc.
4. Reducible, incarcerated, obstructed, and strangulated hernia are all varieties of the same condition.
5. The results of operation for radical cure upon all varieties should influence our prognosis as to the prospects of any one.

Particular stress is laid upon the fourth proposition. Excluding congenital hernia, the author suggests that all other cases are naturally divisible into two classes—acute or strangulated and chronic or reducible; and further that these are distinct in causation, pathology, and course, and that their prognosis and treatment should be separately considered. Under chronic hernia are included the incarcerated and obstructed varieties.

Causation. The exciting causes of acute hernia are doubtless those

usually given, viz., strains, as by sudden lifting, etc.; but it is stated that these cannot produce chronic hernia, the causes of which are comparatively slight, and from within, but which act continuously or frequently. The one is unavoidable, but happens seldom; the other is curable or avoidable, but happens frequently.

Pathological appearances. The sac in chronic hernia is slowly produced, and is never tightly distended; it lies in folds at the point of exit from the abdomen. These folds radiate outward and upward over the parietes, and tend to unite when once the efficient cause is removed, so as to form a collar at the level of the ring.

Course. The course of chronic hernia may be divided into three stages:

1. Pre-hernial, or that which precedes any external evidence of hernia. It is peculiar to this variety.
2. The stage of growth, which lasts from the time of appearance to the period when the efficient cause ceases to act.
3. The stage of rest, when the efficient cause is removed and only subordinate or accessory causes remain operative.

In acute hernia there is but one stage which is terminated by operation, unless reprehensible delay is permitted, when there are two—the stage of tension and the stage of gangrene.

The results of treatment should be kept distinct. In the acute variety the state of the intestine is of the first importance; in the chronic variety, the condition of the abdominal wall. In acute hernia operation is a matter of immediate necessity; in the chronic form, one of convenience. In the acute variety the risk to life is great; in the chronic it is practically *nil*. In acute hernia the vitality is already, before surgical interference, greatly lowered, so that the expenditure of a few minutes more or less over the operation may make the difference between life and death to the patient; in the chronic variety, the time expended on the operation is of secondary importance, so that every detail as to technique may be carefully attended to. After operation for the cure of chronic hernia the foundation for relapse is often laid during the first week, when the parts are still in a plastic condition, and when, if the efficient causes are still acting, a return is unavoidable.

If the viscera protrude, it is due to:

1. The inordinate length of the mesentery.
2. Abnormal attachment of the mesentery to the spine.
3. Constitutional weakness of the walls and abnormal patency of the normal orifices.
4. The effects of injuries, operations, strains, etc.

The influence of constitutional weakness, and the effects of injuries, etc., the author meets with the following statements:

1. A careful study of pathological specimens of reducible hernia reveals none of the changes usually to be found in lesions of other parts of the body, due to sudden causes. It reveals, rather, very definite and well-marked differences between herniæ which have been produced suddenly, *i. e.*, strangulated or acute, and those now under consideration. The appearances, as actually seen, are such as are only compatible with the action of a comparatively gentle but prolonged continuous or frequently intermitting force.

2. A superficial inquiry in the case of a reducible hernia will usually elicit

a declaration of injury, but careful cross-questioning will frequently reveal some condition antecedent to the injury mentioned, which is the real cause.

3. Many persons suffering from hernia are men who have enjoyed continuously good health, are descended from healthy parents, are physically stronger than their fellows, and many have shown, by the fact that they have reached a ripe old age in spite of this drawback, that they are of good constitution.

In explaining the formation of a chronic hernia the author calls attention to the following points:

The abdomen is a closed cavity, the wall of which is composed of three layers; of these, however, the cutaneous may be disregarded, inasmuch as it offers no resistance to the outward progress of the hernia. The muscular coat is quite resistant, but is incomplete at certain points. The peritoneal covering is complete, but offers less resistance. As the contents accurately fill the cavity, if the abdominal wall contracts, the internal pressure is increased and there results slight bulging of the peritoneum at the points at which the muscular wall is incomplete. At first the peritoneum resumes its normal condition after the pressure is removed, but finally, after the bulging has occurred a number of times, the elasticity of the parts is diminished and the pouching becomes permanent. In this stage there may be no symptoms or if present are apt to be so slight as not to be noticed. There are, however, a number of exceptions to this rule, illustrations of which are cited by the author.

Attention is called to the fact that the folds which are seen at the neck of a hernial sac, and which radiate for some distance on the parietal peritoneum, are observed only in the acquired reducible form, and are never seen in a congenital or an acute hernia. The effect of bronchitis in causing a constant cough, and of occupations which frequently demand a strain upon the patient, are considered the efficient causes of hernia, which will surely develop once the pouching of the peritoneum has occurred, if the efficient causes remain active. The author has illustrated the views expressed by frequent references to specimens from the Museum of the Royal College of Surgeons and by numerous clinical cases.

In an attempt at radical cure of chronic hernia the choice of operation becomes a matter of great importance. Any plan will probably fail, however, if the cause which originally produced the condition is not removed. To be certain of its previous removal, it is obviously necessary that there should be no doubt as to its identity. This is the task which the author has assumed, and from his study he believes the following conclusions are justifiable:

1. That chronic and acute hernia are absolutely different things, agreeing only in the fact that they are both protrusions of viscera through their normal environments.

2. That they differ in etiology, pathology, and course.

3. That, especially from the point of view of radical cure, it is important to distinguish between them.

4. That in discussing the feasibility of operations for radical cure, and especially the permanency of their results, the etiology of chronic hernia is of immense importance, since an operation for the cure of the results of a cause is almost certain to be useless whilst the cause remains in operation;

and if the cause can be found the patient may be warned to avoid it after the operation has been performed, in order that permanency may be rendered more probable.

5. That in the case of chronic hernia the cause is never one acting suddenly and singly, as overlifting, strains, falls, etc., but always one acting slowly, persistently, gently, habitually (such causes are difficulties in urination and defecation, certain occupations, and, chiefly and most prominently, coughing in all its forms).

6. That the claims of any operation for the radical cure of chronic hernia cannot at present be properly estimated, and that they never can be unless acute and chronic herniæ are absolutely separated, and the true effective causes of them are duly appreciated, other causes being previously carefully eliminated.

ENTERECTOMY BY PAUL'S METHOD.

PAUL reports the following (*British Medical Journal*, 1894, No. 1727): Woman, aged fifty-one years, was admitted to the hospital, having a strangulated femoral hernia with the usual symptoms. After exposing the intestine, an area was found which had already begun to slough, and from which the contents made their appearance. An incision was therefore made in the median line of the abdomen, and after carefully cleansing the hernia it was drawn into the abdominal cavity, care being taken to prevent contact with the peritoneum in the proceeding. After clamping above and below, the injured portion was cut out with scissors, together with the corresponding mesentery, bleeding-points were ligated, and the divided ends united by a bone tube as recommended by the author. The proximal extremity was dilated, and the distal end contracted, so that it was found impossible to invaginate the former into the latter as the author had heretofore done. It was, therefore, necessary to employ a tube of small size ($\frac{5}{8}$ in. x $1\frac{1}{4}$ in.), fastening this in the distal portion, and by means of the traction thread this was then invaginated into the proximal end—in a direction, therefore, against the current of the contents, and although this method had been found to give good results in the case of experiments on dogs, the author hesitated somewhat about employing it in practice. The patient made a good recovery. During the first twenty-four hours the patient was allowed the yolk of an egg, two ounces of brandy, and some beef essence. This was gradually increased as the condition of the patient warranted.

HORRICKS details in the same journal the following case: A woman, aged thirty-eight, was admitted to the hospital with intestinal obstruction and with severe abdominal pain. Above Poupart's ligament, on the right side, a solid tumor was felt. An exploratory incision was made, which disclosed a tumor implicating a considerable portion of the small intestine. The wound was closed, and the patient recovered from the operation without complication. Three weeks later an operation was performed for the relief of the obstruction. A 3-inch incision was made in the median line rather above the middle. The tumor was drawn out of the incision, and, after emptying and securing the bowel on either side, a V-shaped section of mesentery containing enlarged glands and the affected bowel was excised. After securing the bleeding

vessels a Paul's bone tube was introduced into the lumen having the smaller diameter, and after securing with continuous silk suture it was invaginated into the other open extremity in the manner advised by Paul. The portion of intestine removed measured 39 inches in length; the tumor was found to be a large round-celled sarcoma. The patient made an uncomplicated recovery, and was discharged well at the end of five weeks.

THE DIAGNOSIS AND OPERATIVE TREATMENT OF SOLITARY HYDATID CYSTS OF THE SPLEEN.

AFTER a careful discussion and report of a case operated on by himself, and a study with a summary of sixty-six cases, TRINKLER (*Revue de Chir.*, February, 1894) comes to the following conclusions:

The facts cited speak clearly in favor of operative intervention in the treatment of hydatid cysts of the spleen. This intervention should have for its purpose the discovery of the cyst. Laparotomy, in the full acceptance of that term, should be employed—that is to say, with all the variations proposed by Messrs. Volkmann, Lindemann, Laudau, Säger, etc., accommodating itself to the peculiarities of each cyst.

It is difficult to judge in theory of the merits or demerits of operative procedures, for they all have their good points. There are cases in which Volkmann's operation is apparently less dangerous; nevertheless, when the tumor is small with thick walls and few adhesences, one can, without risking much, operate after the method of Lindemann, Säger, or Pozzi. The last method is the ideal, as the cyst is removed entire.

As a general rule, the incision should be as long as possible; it never does any harm, especially if one desires to employ Volkmann's method.

Possibly one might have to put a couple of stitches more at the top and bottom of the incision at the end of the operation, but it will give the chance to explore all parts of the tumor, to determine its boundaries, its pedicle, and, in short, one will see the actual condition of the organ, a most important factor in planning the operation. As Koenig says, before all one must "see," and this is only possible by a free incision. Consequently the first incision is exploratory and on it depends the choice of operation.

THE ANTISEPTIC POWER OF ICHTHYOL.

FROM interesting bacteriological researches which he has carried on in the hygienic institute of the University of Greifswald, ABEL (*Centralbl. für Bakt. und Parasit.*, 1893, Band xiv., No. 13) deduces the following conclusions concerning its antiseptic and bactericidal power:

1. The ichthyol preparations—ammonium ichthyol and sodium ichthyol—are capable of killing, in weak solutions and short time, the streptococcus pyogenes and erysipelatis. The working of the different preparations is just about the same. In suppuration arising from these bacteriological sources, ichthyol can be used with good results, as has been already shown by actual experience.

2. The staphylococcus aureus and albus, the bacillus pyocyaneus, bacilli of typhoid, ozæna, and anthrax, the spirillum cholerae Asiaticæ, possess a

greater or less resistance to ichthyol, that in certain cases is so marked that pure ichthyol must remain on them for hours before the organisms in the cultures are killed. This is not, therefore, the most useful antiseptic for these organisms.

3. Diphtheritic bacilli, in fresh colonies, were killed by weak solutions of ichthyol, while further developed colonies were overcome with greater difficulty. Therefore, although ichthyol is not useful in the therapeutics of diphtheria, it can be used in prophylaxis both as gargles and in internal medication.

4. Ichthyol has done good service in the treatment of typhoid and ozæna by making the irritation less harmful. It is, therefore, not impossible that also the other infectious diseases mentioned in paragraph 2 may be favorably influenced by ichthyol, whereby, although we can expect little from its antiseptic power, its chief influence may be hoped for in its action on the system.

5. It is recommended that ichthyol be employed only in substance or in a fifty per cent. solution, and where greater dilution is used only with greatest precautions. Weak solutions may contain pathogenic spores, as, for example, staphylococcus aureus, even for a long time, and one must run the risk of reproducing the disease by its use. Weak solutions that have been used before must be sterilized before they are used again, by heating, which can be done without injury to the antiseptic power.

A CASE OF ANTHRAX.

BURRELL (*Annals of Surgery*, December, 1893) reports a case of anthrax, with clinical history and the results of bacteriological examination. The patient made a complete recovery after thorough excision of the growth. The author makes the following deductions from this case:

1. That where applicable the old and obvious method of treatment by complete excision of the pustule, when vital structures are not involved, is best.

2. That where extensive surfaces involving vital parts are involved, the treatment by injecting strong solutions of the most energetic antiseptics may be used.

3. That glandular swelling about the malignant pustule, and apparent systemic poisoning do not contra-indicate operative treatment.

THE RADICAL CURE OF LARGE UMBILICAL HERNIÆ.

GERSUNY (*Centr. f. Chir.*, 1893, No. 43), after discussing the methods employed for closing wounds of the abdomen after laparotomies, recommends the following method for the prevention of relapse after radical operation for umbilical hernia. The method is similar to that employed by him in all his laparotomies. After the incision of the hernial sac, the umbilical scar tissue, which he finds usually adherent to the hernial sac, is resected, and the sac is separated by blunt dissection from the surrounding adipose tissue and then divided. The mesentery is then ligated, if present in the sac, and divided, the stump, together with any intestine, being returned into the abdominal cavity. The sac is then drawn out as far as possible and sutured at the level of the hernial ring; the suturing of the ring then follows.

The peculiarity of this operation lies in the following steps: The recti muscles are next found, most easily by extending the median incision upward in the line of the linea alba. The fibrous sheaths of the recti are divided in their median edges until a point is reached above and below the level of the umbilicus. The distance of the recti muscles from the umbilicus makes it necessary to dissect them out of their sheaths, and especially the tendinous lineæ transversæ, before they can be made to meet in the middle line. They are then united in the middle line by a running suture. The skin is then sutured after the removal of some of the adipose tissue or at least its free dissection up from the underlying fascia. The author believes that by this method he affords a strong support to that part of the abdominal wall about the umbilicus which is liable to be weakened by the spreading apart of the recti muscles.

DERMATOLOGY.

UNDER THE CHARGE OF

LOUIS A. DUHRING, M.D.,

PROFESSOR OF DERMATOLOGY IN THE UNIVERSITY OF PENNSYLVANIA;

AND

MILTON B. HARTZELL, M.D.,

INSTRUCTOR IN DERMATOLOGY IN THE UNIVERSITY OF PENNSYLVANIA.

PEMPHIGUS.

J. F. PAYNE, the well-known dermatologist of St. Thomas' Hospital (*Lancet*, 1893), considers the disease in its several aspects, and recognizes the following forms as being more or less accurately denoted by this name. 1. Pemphigus vulgaris, of which there is an acute febrile form and also a chronic or recurrent form. 2. Pemphigus foliaceus, an extremely rare disease. 3. Pemphigus vegetans, one perhaps still rarer. More doubtfully deserving of the name are: 4. Congenital traumatic pemphigus, a state of the skin that is mostly congenital, sometimes being called "epidermolysis hereditaria bullosa." 5. The so called pemphigus neonatorum. There is also a bullous syphilide that is sometimes called pemphigus syphiliticus. In addition to these we meet with forms of disease resembling pemphigus, which were formerly included under that name, but are now called by such names as erythema bullosum, dermatitis herpetiformis, hydroa, herpes gestationis, etc. The only character common to all forms of pemphigus is that the eruption consists of blebs. The question of the existence of febrile pemphigus, denied by some writers, is discussed, with the report of five cases, which show that acute outbreaks of pemphigus associated with fever, which mostly occur as episodes in the chronic form of the disease, are occasionally met with. Concerning the treatment, the writer is in accord with Hutchinson's estimate as to the value of arsenic, but thinks that there are certain

qualifications which should be kept in mind. In children and young persons it rarely fails to disappear under the use of sufficient doses. After middle life the drug loses some of its efficacy, and in aged people it seems to have very little effect. In these cases quinine, stimulants, and food should be relied on.

THE EXTIRPATION OF LUPUS.

RICKETTS (*N. Y. Med. Journal*, 1893), advises the complete extirpation of lupus either with the knife or the curette, replacing the loss of tissue, where this is considerable, by skin-grafting. This mode of treatment is advised not only for lupus vulgaris, but for lupus erythematosus.

PAPILLARY AND PIGMENTARY DYSTROPHY.

DAVIER (*Annales de Dermatologie et de Syphiligraphie*, 1893, No. 7) has observed and studied histologically two cases of a disease of the skin and mucous membranes which he calls *papillary and pigmentary dystrophy*, it being the same affection which Pollitzer and Janovsky have described under the name *acanthosis nigricans*. Both patients were women, aged thirty-four and forty-two years respectively, in whom, during the evolution of gastric cancer, there was developed a modification of the integuments, characterized by a double process, papillary hypertrophy and pigmentation. The papillary hypertrophy existed around the natural orifices, upon the hands, about the umbilicus, upon the tongue, and in one case upon the gums. The pigmentation, accompanied by a verrucous and even papillomatous condition, was seated principally upon the neck, chiefly the nape, and in the articular folds, where it reached an extreme degree. Upon the trunk it assumed the form of macules similar to plane senile warts, and in some regions, as the wrists and elbows, small confluent plane warts. The beginning of the affection is insidious, but it develops and becomes almost general in its distribution in a few months. The affection is to be distinguished from Addison's disease, ichthyosis, senile warts, and psorospermo folliculaire végétante, with which last it presents certain analogies.

The histological changes consist in an enormous increase of the thickness of the corneous layer and a moderate increase in the thickness of the rete and the stratum granulosum. The glomeruli of the sudoriparous glands were absolutely normal in appearance.

A MIXED CASE OF LUES AND TUBERCULOSIS WITH UNUSUAL LOCALIZATION.

FABRY (*Archiv f. Dermatologie und Syphilis*, 1893, Heft vi.) reports a case of mixed tuberculous and luetic ulcer of the prepuce. The patient, thirty-five years old, had constitutional syphilis, having numerous scars over the body, the result of a syphilitic eruption, and was inclined to tuberculosis. At the time of observation ulcers existed upon the inner surface of the prepuce, which from the history and character of the lesions were diagnosed as syphilitic, and iodide of potassium was accordingly prescribed. This treatment, although continued for some time, was without effect, the

ulcers extending peripherally and in depth. Under the use of sublimate dressings healing took place, but hardness and deep infiltration still remained. Ulceration shortly again occurred, involving the frænum, which it destroyed. A small piece of the prepuce was now excised and examined microscopically by Prof. Ribbert, of Zurich, who pronounced it tuberculous. Under the use of carbolic acid and sublimate dressings, together with mercurial inunctions, a permanent cure was eventually obtained.

THE TREATMENT OF ITCHING.

BRONSON (*N. Y. Med. Record*, 1893), in a paper upon this subject, discusses the various measures useful in relieving this very common and often distressing symptom. These measures are:

A. *The Removal of Local Excitants.* Irritating contacts of all kinds are to be scrupulously avoided. Attention is to be given to the underclothing, which should be of the softest material. Extreme heat or cold must be avoided, as well as sudden changes of temperature. As local excitants may be intra- as well as extra-cutaneous—as when due to toxic materials conveyed to the skin by the blood—depurative remedies, such as diuretics and diaphoretics, are, in proper cases, to be employed.

B. *Sedatives.* Used internally these are less satisfactory than when applied to the skin. The bromides are often of benefit, and hypnotics, such as sulphonal, are occasionally needed. Two internal remedies especially worthy of mention are cannabis indica and gelsemium. Phenacetine and antipyrine are likewise useful. Among local sedatives carbolic acid is the most reliable, and the author recommends its employment in the following formula:

R.—Acid. carbolic.	.	.	.	.	.	.	3j-ij.
Liq. potass.	.	.	.	.	.	.	3j.
Ol. lini	.	.	.	.	.	.	3j.—M.

Sig.—Shake before using.

Salicylic acid and salol act similarly to carbolic acid, but are less effective. Thymol is also useful, but on account of its irritating effect is contra-indicated when the skin is sensitive. Corrosive chloride of mercury also possesses anti-pruritic properties. Cocaine often gives satisfactory results in localized forms of pruritus about mucous orifices and upon abraded surfaces. Water of the temperature of 100° F. and over is likewise useful.

C. *Sensory Stimulants.* It is more especially in such forms of pruritus as are associated with hypopselaphesia [*sic*] that remedies of this class are indicated. Among these agents electricity, either as galvanism or faradism, is of benefit. Strychnine is also of value.

D. *Substitutive Irritants.* Menthol, which is one of the best palliatives of itching, in the author's opinion acts, not by direct inhibition of the molecular movements of the sensory nerves, but by substituting an exaggerated temperature-sense for the perturbed sense of contact.

E. *Alterations of Cutaneous Nutrition.* Jaborandi probably belongs in this class, and is especially useful when the skin is hot and dry. Among the local remedies are ichthyol (5-10 per cent.), tumenol (25 per cent. or pure), occasionally tar, resorcin (3 per cent.), and benzoic acid or benzoin. The author, observing the fact that a large proportion of remedies that allay itching are

oxidizing agents, was led to make trial of solutions of hydrogen peroxide with satisfactory results.

F. Motor Depressants. Among internal remedies gelsemium and jaborandi belong to this class; and the good effects of atropia are probably the result of the secondary or depressant action of this drug. Of the local remedies the first place belongs to hot water. Here also are to be included hydrocyanic acid, conium, arnica, and chloroform.

INVESTIGATIONS CONCERNING THE FUNGUS OF FAVUS.

BIRO (*Archiv f. Dermatologie und Syphilis*, 1893, Heft 6), as the result of his investigations, arrives at the following conclusions:

The fungus of favus is distinguished by variations in behavior upon different nutrient media.

Cultures prepared from crusts experimentally obtained differ slightly from those employed to produce the crusts.

The apparently different favus cultures lose, in a certain measure, their differential characters after re-inoculations continued for a long time upon the same nutrient medium.

Therefore, it results that there is a certain relation between the aspect of the favus culture and the nutrient medium upon which the fungus was cultivated; that the fungus adapts itself to the soil upon which it is nourished. Since the fungus adapts itself to the soil, and since, after re-inoculation continued for a long time upon the same nutrient medium, the apparently different cultures obtained by different authors lose in a certain measure their differential features, we are not certain whether the authors have not observed one and the same fungus.

We have no ground to assert that there are several fungi of favus.

EXTRA-GENITAL VEGETATIONS.

GEMY (*Végétations Extra-genital*, Algiers, 1893), in a monograph upon this subject, arrives at the following conclusions:

"Vegetations, warts, and molluscum contagiosum have the same parasitic etiology.

"This microbic agent, not yet discovered by the bacteriologist, exists incontestably from clinical evidence.

"All probabilities serve to establish the coccidial nature of this parasite.

"Treatment by excision and cauterization should be the great exception.

"The application of powders and, above all, salicylic acid and savin, are amply sufficient to fulfil almost all indications."

THE NATURE OF XANTHOMATA.

HALLOPEAU (*Annales de Dermatologie et de Syphiligraphie*, 1893, No. 8), in a paper upon the subject of xanthoma, its proximate cause and complications, formulates the following conclusions:

1. The xanthomata are benign neoplasms of embryonal origin, *i. e.*, *nævi*, according to the recently formulated conception of these tumors.

2. They can be localized, as Koebner has shown, in a region occupied by a nævus.

3. They can form long bands following the course of the nerves, a disposition characteristic of nævi.

4. They are due, conformably to the views of Touton, to the persistence in the tissues and to the proliferation of embryonic cells which produce fat.

5. They can secondarily become the seat of inflammations, hyperæmias, or hemorrhages.

6. The tumors occurring upon the limbs, being very vascular, can be so effaced as to be with difficulty recognizable.

7. The jaundice which frequently accompanies the xanthomata is connected, conformably with the opinion of Kaposi, with their extension to the biliary passages.

8. The glycosuria which in a number of instances has coincided with them is connected, in all probability, with another visceral localization of the tubercles, the pancreas being their most probable situation.

9. This visceral localization is observed chiefly when the xanthomata occupy the limbs under the form of punctate tubercles.

10. The existence of macules in the neighborhood of the tumors shows that they are capable of undergoing a retrograde evolution; this fact, as well as the possibility of changes of volume according to the degree of repletion of the vascular system, explains the intermittence of the jaundice and glycosuria with which they may be accompanied.

OBSTETRICS.

EDWARD P. DAVIS, A.M., M.D.,

PROFESSOR OF OBSTETRICS AND DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC;

CLINICAL PROFESSOR OF DISEASES OF CHILDREN IN THE WOMAN'S MEDICAL COLLEGE;

CLINICAL LECTURER ON OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE;

VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.;

ASSISTED BY

WILLIAM H. WELLS, M.D.,

ASSISTANT DEMONSTRATOR OF CLINICAL OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE,

PHILADELPHIA; CLINICAL ASSISTANT TO THE CHAIR OF OBSTETRICS AND

DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC.

TWO FÆTUSES REMOVED FROM THE PERITONEAL CAVITY AT ONE OPERATION.

BYFORD (*American Journal of Obstetrics*, 1893), at a meeting of the Gynecological Society of Chicago, presented two fœtuses at about the same stage of extra-uterine development—*i. e.*, about four months. The patient from whom they were taken was in her eighth pregnancy and had a history of old pelvic disease. The uterus and appendages were found matted together in a conglomerate mass the size of two fists, with the intestines adherent over them.

A hæmatosalpinx was found on the right side, and beneath it a membranous sac adherent to the pelvis, containing a fœtus with the bones well preserved. After tying this off, another almost exactly similar sac was found on the left side. No definite placenta was found. The recovery was unusually smooth throughout, the temperature remaining below 100° excepting a temporary rise due to a stitch abscess.

ECTOPIC PREGNANCY.

MARTIN (*Berliner klinische Wochenschrift*, 1893, No. 24) concludes his series of articles on ectopic pregnancy with a list of 41 cases of pure extra-uterine gestations divided into three groups.

In the first group of 14 cases, the ovum, more or less intact externally, lay in the ovisac. No blood had entered the abdominal cavity, but the ovum was in varying stages of maceration and resorption.

The second group includes 9 cases of rupture. 16 cases of abortion constitute the third group. In 2 cases both abortion and rupture obtained.

A. In the 14 cases of the first group, the duration of pregnancy was as follows: In first month, 6; second month, 3; third month, 2; fourth month, 2; eighth month, 1. The pregnancy in each case was interrupted through hemorrhage into the fœtal sac. The tube was intact; its external orifice open, and it contained no trace of blood.

In the 6 cases of one month and the 3 of two months, no coherent part of an ovum and no trace of a fœtus were present.

In the 2 cases at three months, in 1 the fœtus was found in the amniotic cavity. The same condition was found in 1 at four months and in the eight months case. In some cases the uterus, chorion, and amnion were separated by intruding clots, the intra-uterine ovum being involved. In others the ovum was wholly destroyed by blood and only the chorion tufts were left. In only 3 women were fœtuses found. If the ovum escapes into the abdominal cavity early, it is absorbed; later, it undergoes degenerative changes, and as such may be met with surrounded by, or mixed with, bloody detritus. What ultimately results from these ova is hard to say.

The 6 cases of one month and 3 of two months seemed to be on the way to safe restoration. The sac contents showed ovular fragments interspersed with coagula.

B. The 9 cases of rupture. It is striking that in 4 the ovum had isthmian insertion where the ampulla passes into the isthmus. In 4 the tubal end was inserted into one ovarian cavity, and the blood had no outlet save by rupture. In the others there seemed no hindrance to the escape of the blood by the physiological way. Three times the fimbriated end was agglutinated, four times the end of the ovary formed a firm mass, twice an ampullar hæmatoma; in 1, profound muscular atrophy at the point of insertion, and between the scanty muscle fibres lay great blood spaces. In 1 there was hernia of the tubal mucous membrane; in 4 the tube-walls showed traces of chronic salpingitis, the rupture occurring at the placental site. In 1 case the abdominal end was sharply bent, and ruptured immediately at the ovular insertion, so that the blood could not escape, and this had led to complete occlusion of the lumen of the tube. It appears, then, that in all cases of rupture peculiar difficulties existed which precluded the physiological way,

and in all cases rupture is the result of peculiar complications of the ectopic ovular insertion.

C. Regarding the cases of so-called tubal abortion the author says: In this third group it is worthy of note, that of 16 cases fourteen insertions of the ovum were in the ampullar part of the tube. The swelling thus occasioned lessened or prevented the escape of the blood by the abdominal mouth of the tube. In one case the tube was wrapped around an ovarian cystoma, both having grown together into a so-called ovarian tumor. In the other the whole tubal mass was greatly developed intra-ligamentously, and through peritoneal thickening the tube was shrunken peripherally from the ovarian insertion. Nevertheless the blood had forced its way through the narrowed channel and distended the abdominal mouth of the tube until it gave way laterally. It is also significant that of these 16 cases, in 9 the pregnancy had advanced to two months; in 4 only abortion took place in the first month; in 1 at three months, and in 2 during the fourth. The ampulla and isthmus are capable of retaining the ovum up to this point of size, but the wall becomes as thin as paper. The muscular elements suffer most; hemorrhagic foci separate them and the individual muscle-cells become cloudy or atrophied. The mucous layer, on the contrary, is little the worse; its longitudinal folds unite stellar-like before and behind the insertion of the ovum. As to the mechanism of the abortion, a self-originated contraction of the tube is improbable; in fact, its muscular elements are incapable of it. According to his observations, the author thinks the expulsion of the ovum is due to hemorrhage which occurs at the point of ovular insertion, arising either from incongruence between the ovum and its point of support, or from traumatic lesions. The bleeding may intermit or remit, or become massive, sweeping all before it. It follows the normal channel unless this be occluded, when rupture occurs.

SYMPHYSIOTOMY.

LEWERS (*Lancet*, London, 1893, No. 3649) reports a case of symphysiotomy done on a II-para. The external measurements were: between spines, $8\frac{1}{2}$ inches; iliac crests, $10\frac{3}{8}$ inches; external conjugate, $6\frac{1}{4}$ inches. One normal labor had previously taken place, but the child was very small—indeed, was supposed to be premature. Section of the pelvic joint was attempted by the aid of a probe-pointed bistoury, but it proving insufficient on account of ossification of the joint, an Adams saw was successfully used. The joint separated 5 centimetres, and the child was safely delivered by means of the forceps. After some complications the patient made a good recovery.

THE DIAGNOSIS OF PREGNANCY.

LAWSON TAIT (*Provincial Medical Journal*, 1893, No. 140), in a clinical lecture, points out the great difficulties experienced in obtaining truthful and correct histories from illegitimately pregnant women, and the great caution to be exercised by the obstetrician examining such patients. Several interesting cases are reported from his great experience, in which he himself and others have had but narrow escapes from grave errors in diagnosis through the untruthful histories given by patients. In closing, he recommends the

greatest care to be exercised, particularly in regard to the manner of asking questions as to the absence of menstruation. A question should be put in as casual a manner as possible as to when the last period took place; if within a month, exercise the utmost caution to prove that the case cannot be one of pregnancy. The great probability is that it is not one; but the patient may be untruthful, and even regularly recurring menstruation is not incompatible with pregnancy. If the answer given is to the effect that the last period was some months previous to the date of examination, and if the abdominal tumor is of a size which would be that of a pregnant uterus of corresponding date, the chances are infinitely in favor of pregnancy. It should also be ascertained whether menstruation was regular previous to its cessation, and if the ceasing was an abrupt one. If the latter, and the previous menstruations have been regular, the certainty of the diagnosis of pregnancy is complete. If the previous menstruations have been irregular and the cessation not sudden, the history altogether fails, and may be entirely neglected. It should be borne in mind that the adolescent anæmia of young girls suspends their menstrual show almost invariably, but it does not necessarily interfere with their productive capacity.

THE SECRETION OF HUMAN MILK.

BASCH (*Archiv für Gynäkologie*, Band xlv., Heft 1, p. 15) gives in a most instructive and interesting paper the results of his investigations concerning the secretion of milk in the human female. According to various observers, traces of milk glands may be observed in a fetus four centimetres long. These consist of a whitish spot one-half millimetre broad, minutely elevated, due to a heaping together of the cells of the Malpighian stratum. Later this becomes more marked and the spindle cells of the corium are bedded in a cellular stroma. A number of flask or cupped processes extend from the Malpighian stratum up into the cutis, and later become ducts. Gradually a wall forms around the central swelling, separated from it by a groove or depression. This wall in man remains small, while the central papilla grows and ultimately takes its permanent form. In the ruminants (as the cow) the outer wall grows, while the papilla remains within until it forms a tube or blind sac with the papilla at its bottom where the milk ducts open. In the marsupials (as the kangaroo) there is at the bottom of this sac or tube a small projecting nipple, so that in these animals we may find, as it were, the point of union of two systems of development, one leading to the human nipple, the other to the udder of the cow. After birth the degree of the development of the nipple seems to be parallel with the longitudinal growth of the child—the longer the child, the more the nipple is developed. In the formation of the nipple, both the gland foundation and the cutis take a part. Its construction represents a histo-biologic process which is the resultant of many components, of which one is active, one passive. The active element is the epithelium of the gland substance and nipple zone; the passive agent, the gland basis and its continuation into efferent rays. The nipple is made up of smooth muscle fibre, nerves, fatty tissue and vessels. A network of muscle fibres supports and surrounds the base and sends fibres upward. The nerves form cord-like bundles on the margins of the fat divisions and of the

gland stroma, some ending in the individual muscle fibres, some in the skin papillæ following the course of the vessels. The capillaries which enter each papilla of the nipple, surround the exit ducts and ramifications of the gland with a basket-like network. The veins surround the boundaries of the nipple in a polygon, and a deep venous circle returns the blood to the vena thoracica. The fatty matter is so distributed as to form a series of layers under the nipple area, so that this is uplifted above the surrounding level.

Three chief varieties of congenital malformations of the nipple may be recognized:

1, Papilla plata; 2, papilla fissa; 3, papilla invertita. Etiologically, these deformities represent various stages of arrested development.

The function of the nipple is both that of a mouthpiece to the gland and also of a closing apparatus. Its shape may be variously modified by the sucking efforts of the child. Numerous measurements show a relationship between the height of the nipple and the breadth of its base; the higher the nipple the smaller generally its base, and *vice versa*. It would seem that it is due to a contraction of the musculature of its base and papilla, and that the vascular apparatus plays only a subordinate part. Regarding the action of the nipple in suckling, he says: If it is desired to obtain milk from the nipple of a woman, it is necessary to squeeze its base between the thumb and forefinger. As the milk wells up from many small openings it will be seen that the nipple widens and shortens; a sort of lessened tonus seems induced. If the pressure be relaxed, the nipple erects itself again. This same condition probably obtains during the sucking of the child. Not merely does the tongue surround the nipple, but it also compresses it from base to apex with a slight drawing action. The aspiratory effort must also be remembered and considered. The aspiratory power of the child unaided is not sufficient to overcome the normal tonus of the muscular apparatus of the nipple. The compression of the base of the nipple is a marked and important constituent of the act of sucking. The alternating increasing and diminishing compression of the nipple, in connection with the aspiratory effort of the child, empties the breast in a rational and continuous manner, so as to maintain a due relationship to the child's breathing and acts of deglutition.

TWO CASES OF UTERINE RUPTURE.

BOSSI (*Nouvelles Archives d'Obstétrique et de Gynécologie*, 1893, No. 7) reports two cases of uterine rupture, in one of which the foetus had penetrated the abdominal cavity. In this case the rupture occurred after violent uterine contractions, during podalic version, the foetus slipping from the surgeon's hands into the peritoneal cavity. The patient had a contracted pelvis and was a IV-para, all previous labors having been premature and difficult. Porro's operation was performed and the pedicle, encircled by elastic bands, replaced in the abdominal cavity. The operation lasted twenty-five minutes. After twenty-five days all the elastic ligature came away by the vagina. Recovery complete.

In the second case rupture was not recognized. The case was one of placenta prævia in which podalic version was done. When the surgeon pro-

ceeded to extract the placenta he found the patient unconscious. The uterus was the seat of extensive rupture. Porro's operation was performed on this case also, the technique being the same as on the previous one. Profound collapse followed; the patient did not regain consciousness and died exhausted. The heart was found to be feeble, the valves being affected. After discussing the frequency of uterine rupture the author considers the causation to be due to narrow pelves, transverse presentations, and deficient uterine resistance. It is generally admitted that the point of least resistance is the inferior uterine segment, and this becomes less resistant by reason of the contraction of the longitudinal muscular fibres, which tend to elevate the inferior segment and thin it, while enlarging the fundus. In these two cases the rupture took place below during energetic contractions, the tear being longitudinal. He considers Porro's operation to be the best treatment.

RESTORATION OF THE NEWBORN.

OEHLSCHLÄGER (*Centralblatt für Gynäkologie*, 1893, No. 31) contributes an article relative to the restoration of the newborn. In most cases he believes the failure of such efforts to be due to obstruction of the glottis by the backward pressure of the tongue, and advises that this be drawn well forward. Then, either by the direct application of the attendant's lips to those of the child or by passing a soft catheter into the larynx, the air can readily be caused to go into the child's lungs. Such cases are bluish or dark in the face. Should they, however, be pale and collapsed, indicating weakness or failure of the heart, then in addition to the above measures employ pressure to the cardiac region, making it rapidly and rhythmically, so as to imitate the normal heart-beat. As the walls are elastic and soft, direct heart manipulation may thus be practised.

A CONTRIBUTION TO THE KNOWLEDGE OF THE MUCOUS MEMBRANE OF THE NORMAL UTERUS.

HOFMEIER (*Centralblatt für Gynäkologie*, 1893, No. 33) contributes an article relative to the direction of the ciliary movement in the uterine mucous membrane. Having been induced to doubt the generally received assertion that the cilia wave from within toward the tubes, he caused numerous observations to be made on the uteri taken from recently slaughtered cows. As in all these the ciliary motion was from the tubes toward the external os, he then continued his investigations, using uteri freshly removed from women for various causes. The observations not merely included watching changes of position of minute particles scattered on the membrane, but also of the cilia themselves, the specimens being placed in fresh salt solution immediately after operation. The microscopic examination gave the following results: In all, seven specimens were examined; one uterus having been removed for sarcoma, the others for various affections, and in all the movement of the cilia was toward the os and from the tubes, except in one case where a small counter-current was observed, and in another, where motion seemed altogether absent. In several, very slight motion could be seen. From these observations the author concludes that it may be asserted that uterine ciliary movement is from the tubes toward the external os; this being true even

in Case 2, who was fifty-three years old, although it is asserted that after the menopause ciliary movements cease.

ORBITAL TUMOR IN A NEWBORN INFANT.

COURANT (*Centralblatt für Gynäkologie*, 1893, No. 32) reports a case of singular orbital tumor in a newborn male infant. The child was normal in all respects save a large swelling of the left eye. There was protrusion of the bulb two centimetres beyond the root of the nose, which was separated by a shallow groove from an even tumor completely filling the orbit and mostly projecting beyond the lids. The circumference was 14.5 centimetres, diameter 4.5 centimetres. The tumor was readily removed, the orbit emptied with but slight bleeding, and a firm band which extended backward from it into the deep part of the cavity ligated and cut. Recovery was complete.

Under the microscope the contents of the tumor proved to be connective tissue, muscle fibres, mucous and sebaceous glands, hair roots, cartilage, and bone. Its embryonic origin was an anomalous formation of a secondary ocular sac.

SYMPHYSIOTOMY.

WALCHER (*Centralblatt für Gynäkologie*, 1893, No. 25), although not a special opponent of symphysiotomy, believes the operation should be limited to the utmost in its scope. Out of five hundred and fifty births per year in his establishment, he has as yet had no occasion to perform the operation. In the last year he has had to perform Cæsarean section but once for narrowed pelvis, all the other labors in this class of cases having come to a fortunate end for the mothers and generally for the children. The condition of the symphysis after the operation is also an objection. In many cases there is either a loose joint or ankylosis—both great disadvantages to the patient. The design of the symphysis is to form with the sacro-iliac joint an elastic, springy connection between the thighs and the vertebral column. This is so constructed that the haunch bones and sacrum do not move in one axis, but that the pelvic planes converging from before backward form two co-operating axes, which for the execution of a movement require a sliding of the haunch bones in the symphysis. If the symphysis be ankylosed, the movement in the sacro-iliac joint is lost. When this occurs the jar in walking will be transferred directly to the spine, a most important point in the movements and carriage of the patient. A loose joint in the symphysis lessens safety. Concerning the manifold injuries of bladder and urethra already published, the author believes that even with improved technique not much better results will follow in the future.

GENERAL PUERPERAL PARALYSIS.

SOTTOS (*Archives de Tocologie et de Gynécologie*, 1893, No. 6) reports the case of a woman, aged thirty years, of neuropathic antecedents and general ill-health, having had successively several difficult pregnancies followed by painful labors, who was almost immediately taken with an ascending paralysis. The disease appeared rapidly, invading the limbs and trunk with no cephalic

symptoms. The face was intact, but the tongue was affected. The onset was accompanied by acute pain, little alteration of objective sensibility being observed. Marked muscular atrophy and disappearance of faradic contractility followed. There was also present some irregularity of the sphincters. The malady was at its height in three weeks and remained stationary two months, when the paralysis began to amend. Phthisis set in and death followed three months after onset of paralysis.

The diagnosis of either acute polyneuritis, general acute anterior paralysis, or of diffuse central myelitis was made. Although these affections are difficult to separate, yet the acute pains and rapid extension of the paralysis to the limbs, trunk, and tongue, without any accident menacing the life of the patient, indicate peripheral neuritis.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

EXTIRPATION OF THE URETHRA FOR CARCINOMA.

ZWEIFEL (*Centralblatt für Gynäkologie*, 1894, No. 1) presented a patient before the Leipzig Obstetrical Society upon whom he had operated successfully for cancer involving the urethra. The woman, aged thirty-eight years, had been declining in health for a long time, although the local symptoms were of only a few months' standing, *i. e.*, dyspareunia and pain on urination. She had had no hemorrhage. On examination, the meatus was found to be encircled by a fungoid ulcerating growth, which also involved the clitoris; a specimen removed by the curette was examined microscopically, and was found to be epithelioma.

The operation was as follows: A circular incision was first made around the urethra, then symphysiotomy was performed, a chain-saw being required to separate the bones. The urethra was freed from its attachments, and the crura of the clitoris were dissected out as far as their attachment to the bone. The urethra was then split, in order to determine the exact extent of the disease, which was found to involve the sphincter vesicæ and a portion of the posterior wall of the bladder. The ureters were located by palpation, as their openings could not be identified. The diseased tissue was excised a little at a time, as it was necessary to stop at intervals and apply ligatures, on account of the profuse hemorrhage. The bladder was closed by a double row of sutures. In order to remove the entire urethra and clitoris, the anterior vaginal wall was divided transversely, and the hemorrhage was controlled temporarily by suturing the edges of the wound with continuous catgut. The symphysis was then united with wire, and the external wound was closed.

An artificial urethra was next constructed in the following manner: The

abdomen was opened by a median incision just above the symphysis, when the uterus was found to be fixed in a position of retroflexion (with adhesion of the left tube) in such a way as to exert traction on the bladder. The adhesions were separated, a small incision was made in the posterior wall of the bladder, and a rubber drainage-tube was inserted, stitched into the opening, and carefully surrounded with peritoneum. The tube was isolated from the general peritoneal cavity by drawing the omentum down beneath the vesical opening. The abdominal wound was closed in the usual way, the tube (furnished with a stopcock) being allowed to protrude from its lower angle. The large cavity left behind and below the symphysis was tamponed with sterilized gauze, and the cleft in the anterior commissure of the vulva was sutured. The hips were encircled with wide strips of plaster, as after a puerperal symphysiotomy.

The patient's convalescence was uninterrupted. The sutures in the bladder held perfectly, and the viscus was emptied at regular intervals through the tube, the patient soon learning how to attend to it, opening the stopcock whenever she felt discomfort. She was discharged having a depressed cicatrix below the symphysis, but with the vaginal wound entirely closed by granulation, the vagina being of normal length.

[We have reported this operation at some length, because it seems to us a triumph of urethral surgery, only second to Pawlik's case of resection of the entire bladder for malignant disease.—H. C. C.]

THE ABDOMINAL INCISION IN CÆLIOTOMY.

ABEL (*ibid.*) claims that he always avoids ventral hernia by adopting the following technique: Instead of the median incision he makes one through the skin half an inch to the left of the linea alba. Exposing the sheath of the rectus, he opens it by a small incision and penetrates the muscle by blunt dissection until the posterior layer of fascia is felt, which is incised between forceps, as well as the peritoneum. The wound is then enlarged with angular scissors. In suturing no attempt is made to secure exact apposition of the edges. Previous to inserting the sutures the torn muscle is cleansed with a five per cent. solution of carbolic acid. From two to four deep sutures are introduced an inch from the edge of the wound, the edges of the skin being approximated with superficial sutures. A firm cicatrix results, and hernia has not been noted in any of the writer's cases.

ENDOMETRITIS EXFOLIATIVA.

FRANQUÉ (*Zeitschrift für Geb. u. Gynäkol.*, Band xxvii., Heft 1), after a careful study of this subject, arrives at the conclusion that in many cases the microscope alone does not furnish aid in making a positive diagnosis between early abortion, extra-uterine pregnancy, and membranous dysmenorrhœa.

ENTEROPTOSIS (GLÉNARD'S DISEASE) IN ITS RELATION TO GYNECOLOGY.

MEINERT (*Centralblatt für Gynäkologie*, 1893, No. 42) makes the sweeping assertion that probably the majority of gynecological patients suffer from prolapse of the gastro-intestinal tract. Movable kidneys and retroflexion of

the uterus may coexist and give rise to characteristic symptoms, yet these are not the main features in the case, the real trouble being general prolapse of the bowels. It is possible that many phenomena, such as chlorosis, hyperæmia gravidarum, menstrual disorders, etc., are really symptoms of enteroptosis (*enteroptosische Krisen*). Many women never feel so well as during the later months of pregnancy, when the prolapsed abdominal viscera are replaced in their normal position by the pressure of the enlarging uterus (!). The frequent inclination of the gravid organ toward the right is due to gastropnoia, and many gastric symptoms regarded by gynecologists as hysteroneuroses are undoubtedly due to the same displacement of the stomach.

[It is impossible to accept this theory in sober earnest. With all due deference to the writer's keenness of observation, it would seem as if he were seeking to push a recent "fad" to the extreme limit.—H. C. C.]

NEW OPERATIONS FOR STENOSIS OF THE OS UTERI.

VULLIET (*Centralblatt für Gynäkologie*, 1894, No. 3) describes and figures an ingenious plastic operation for antelexion and stenosis, the steps of which are as follows: With the patient in the dorsal posture the cervix is drawn forcibly downward and backward, and an incision is made at the vaginal junction, encircling the left half of the cervix. The vagina and bladder are separated as high as a point above the angle of flexion. The cervix is then split anteriorly up to this point, the bladder being held out of the way with a sound, and the uterus in a position of anteversion by another sound. A second incision around the cervix in the line of the crescentic incision is then made, forming a flap, which is then turned upward and sutured between the edges of the vertical cut, after which the vaginal wound is closed. A large sound can now be passed readily, and it will be found on examination that there has been a notable correction of the stenosis at the point of flexion.

BORYSSOWICZ (*ibid.*) commends this procedure for simple stenosis of the os externum on account of its easy execution, painlessness, and permanent results. Drawing the cervix downward and backward, he introduces a special fenestrated sound into the cervical canal. A curved needle carrying a double silk suture is passed transversely through the cervix an inch above the os externum, traversing the opening in the sound. The latter is then withdrawn with the ligature, which is divided, and one suture is tied tightly with a surgical knot on either side and is cut short, the other two being tied loosely at first, and gradually tightened four or five days later. The vagina is tamponed with gauze, the patient being kept in bed for three or four days. Daily vaginal irrigation with bichloride solution is employed, and the ligatures come away at the end of two weeks, when the os will be found to present a transverse fissure.

SENILE ENDOMETRITIS.

JACOBS (*Polyclinique*, 1893, No. 10) does not believe that the menopause exerts a curative influence upon endometritis and resulting leucorrhœa. Endometritis after the climacteric may be accompanied by a malodorous discharge, which might readily awaken the suspicion of malignant disease, especially if the patient presents also emaciation, pain, and visceral disturb-

ances. Eczema, acne, or pruritus vulvæ are frequently present, and mucous polypi of the cervix are found not infrequently. The writer recommends curettage.

PATRU (*Revue Méd. de Suisse Rom.*, 1893, No. 5) compares purulent senile endometritis to ozæna. It usually occurs in women over sixty, and is sometimes of bacterial origin. The uterus may be of normal size, and not especially sensitive to pressure, though the introduction of a sound causes much pain. The patient may complain of pains in the back and pelvis. Her bad appearance, together with the foul vaginal discharge, may seem to point to cancer of the corpus uteri, though the examination shows nothing suspicious. Vaginitis is often present, and sometimes cicatrices—in fact the so-called “adhesive vaginitis” may be secondary to the purulent endometritis. The prognosis is favorable, since the affection tends to disappear spontaneously with advancing years. Malignant degeneration has not been noted as a result of senile endometritis; sepsis from prolonged suppuration is, however, a possibility. The treatment recommended is dilatation, curettage, and cauterization of the endometrium, with frequent antiseptic vaginal injections.

INOCULATION WITH CANCER.

SIPPEL (*Centralblatt für Gynäkologie*, 1894, No. 4) reports several cases which seem to confirm the now generally accepted view that healthy tissue may be inoculated by simple contact with a malignant growth. In one case a small circumscribed nodule was found behind the posterior commissure, where the cancerous cervix of a prolapsed uterus had rested upon it, the vaginal wall being elsewhere perfectly healthy.

In another an apparently simple multilocular ovarian cyst was removed, suspicious material from a secondary loculus escaping into the peritoneal cavity. The peritoneum was healthy. The patient was discharged in March perfectly well; but returned in October of the same year with extensive ascites, cancerous infiltration at either side of the cicatrix, at the sites of the sutures, and multiple nodules in the peritoneum, the nature of which was proved by an explorative incision. The presence of the minute cancerous nodules developing in the fascia at the needle-punctures seemed to support the theory of infection from the fluid which entered the peritoneal cavity at the time of the first operation.

A further proof that the constriction of the tissues by a suture may cause such a change in them as to furnish a *locus minor resistantiæ* for the development of secondary carcinoma seemed to be furnished in a case of vaginal hysterectomy, in which a piece of silk was found in the centre of a recurrent nodule in the cicatrix.

THE DIAGNOSTIC VALUE OF UROBILINURIA.

MANDRY (*Archiv für Gynäkologie*, Band xlv., Heft 3) summarizes the results of his observations as follows: In healthy puerperæ no excess of urobilin is noted in the urine, the reverse being the case after obstetric operations and laceration of the perineum. As a rule, urobilinuria is not present after minor gynecological operations, but only after difficult cœliotomies. It

possesses no positive diagnostic value in connection with pelvic hæmatocele, and may result from nutritive disturbances in afebrile as well as in febrile affections.

MENSTRUATION AND OVULATION.

LEOPOLD and MIRONOFF (*ibid.*) conclude, from their surgical and pathological studies of this subject, that: 1. Menstruation and ovulation usually coincide, though the former often occurs independent of the latter. 2. Menstruation is directly dependent upon the presence of the ovaries and the normal development of the endometrium, and *not* upon the ripening and bursting of a Graafian vesicle. 3. Ovulation usually occurs at the time of the monthly flow in consequence of the increased congestion of the pelvic organs at this time, when a typical corpus luteum results. 4. Ovulation may occur at other times during the month, though seldom under physiological conditions. 5. Sometimes the increased blood-pressure due to the menstrual nîsus may lead to the rupture of an unripe ovisac, when an atypical corpus luteum results. 6. Even after the climacteric, normal ovisacs may persist and may rupture physiologically, atypical corpora lutea resulting.

PÆDIATRICS.

UNDER THE CHARGE OF

LOUIS STARR, M.D.,

OF PHILADELPHIA;

ASSISTED BY

THOMPSON S. WESTCOTT, M.D.,

OF PHILADELPHIA.

THE TREATMENT OF HYDROCEPHALUS.

WYSS (*Correspondenzblatt f. Schweizer Aerzte*, 1893, No. 8, p. 289) reports a case in an infant aged eight months, in which repeated puncture produced very gratifying results. In the course of a year seven punctures in all were made. After each operation the symptoms of cerebral compression diminished; the sight, which had been greatly affected, returned to normal after the fourth puncture; and measurement of the head showed manifest diminution in all the cranial diameters. One year after the last puncture the child, then two years and three months old, was physically well developed, carried his head easily, could sit up, had twenty teeth, but could not yet walk. For a year he had had only one attack of convulsions, which had previously been very frequent. He heard well and had good vision, could sing and repeat words and phrases, but was incapable of forming them spontaneously.

In view of this success, the author confirms the reports of the advantages

of puncture made by other writers: disappearance of convulsions (Bergmann); favorable influence upon the physical development (Rehn, Phocas, Quincke, Karnitzky, Wyss); psychical development and re-establishment of vision (Wyss). The operation is not devoid of inconveniences, but these can be avoided. Cephalhæmatoma consecutive to the puncture is very rare in these cases, and can be avoided by puncturing the lumbar canal. Infection of the meninges, with consequent meningitis, is not to be feared when the operation is performed under rigid antisepsis. The collapse which has sometimes followed the puncture is never alarming. Finally the author concludes that puncture and aspiration of the cranium or of the lumbar canal are indicated in acute meningitis accompanied by phenomena of compression, in tubercular and syphilitic meningitis of slow progress, and in the increased size of the head observed after certain meningites.

TREATMENT OF WHOOPING-COUGH BY RECTAL INJECTIONS OF CARBON DIOXIDE.

BERGEON (*Lyon Médical*, 1893, No. 26, p. 254) suggests a new field for gaseous rectal injection in treating whooping-cough, a plan which he has used successfully in the case of his son, aged three years.

Immediately after a kink, provided three hours had elapsed since the ingestion of food, he administered a gaseous injection of from one to two litres of carbonic acid gas, containing a few centigrammes of pyridine. The child could eat immediately after the injection, which gave rise to no digestive disturbance. After a fresh kink the injection may be repeated at four-hour intervals. In severe cases it may be necessary to keep up the injections during the night. In some cases the injections have been given five or six times in the twenty-four hours. The most severe cases are said rarely to resist this treatment more than a week.

LOCAL TREATMENT OF INCONTINENCE OF URINE.

POUSSON (*Journal de Médecine de Bordeaux*, 1893, No. 21) states that incontinence of urine in children may be classified under three pathogenic forms: 1. That dependent upon atony of the sphincter. 2. The vesical irritability of Trousseau, without any alteration of the sphincter. 3. Irritability of the membranous portion of the urethra, or contracture of the sphincter. Cases due to atony of the sphincter, and those dependent upon vesical irritability, as described by Trousseau, in which belladonna proves most efficacious, are easily understood; but in association with contracture of the sphincter, incontinence seems paradoxical. M. Janet has given this ingenious pathogeny: such children are neuropathic, emotional, and preoccupied all day by their urinary function, interrupting frequently their play and work to micturate—polyurics and pollakiurics. This watchfulness does not entirely remit at night: when they sleep deeply they return to it, and imbue their dreams with the desire to micturate, just as they constantly introduce it into their sports by day.

In all these forms the different medicinal remedies are not to be neglected; but when they fail, it is necessary to have recourse to local treatment, which

acts by excitation of the sphincter. The induced current is the more commonly employed, and is applied by introducing into the urethral canal a slender bougie containing a metallic conductor terminating in an olive tip which is brought in contact with the sphincter. A feeble current is used and kept up for several minutes, and the operation is repeated daily. Decided improvement is obtained after several days.

The author reports encouraging success with this treatment, especially in seven cases which had resisted all the usual medicaments. Among these patients a little girl was cured quite rapidly. This case is emphasized, because the efficacy of local treatment in the female has been denied. Six of the patients had atony of the sphincter, the seventh had contracture of the sphincter. All were cured rapidly.

TUMOR OF THE ORBIT, IN A NEWBORN CHILD.

COURAUT (*Centralblatt f. Gynäkologie*, 1893, No. 32, p. 141) reports a rare instance of dermoid tumor of the orbit causing exophthalmos at birth. The infant was the sixth child of a woman whose antecedents could not be ascertained. Immediately after birth the left eye was observed to be markedly displaced forward by a mass which seemed to fill the entire orbit. The circumference of the tumor measured anteriorly 14.5 centimetres; its height was 3 and length 4 centimetres; the lids were separated 2.75 centimetres. The next day the tumor was enucleated with the eye; it contained connective, muscular, osseous, and cartilaginous tissue, mucous and sebaceous glands, hairs, etc. The child made a good recovery.

AN ASCARIS IN AN INFANT OF THREE WEEKS.

MILLER (*Jahrbuch f. Kinderheilkunde*, 1893, Band xxxvi., p. 39) records an interesting case of a newborn infant in which, after the fall of the cord, umbilical suppuration occurred, leading to perforation of the intestine. From the fistula thus formed a lumbricoid worm was discharged. The child later succumbed to pneumonia. The chief interest in the case lies in determining the method of entrance of the egg of the parasite. As the child was nourished at the breast from the time of its admission to the hospital on the third day after birth, it is most probable that infection occurred during the first three days of life, possibly by means of water used to dilute cow's milk for its feeding.

Another striking fact is the rapid development of the worm, which, at the time of its exit through the umbilical fistula, measured 18 centimetres in length. According to Leuckart the ascaris attains this size only after three or four months. The part played by the parasite in the production of the intestinal fistula is also a question of interest. Authorities are divided upon the point whether ascarides are able to perforate the intestinal walls. Mondière, Leroux, Siebold, and Leuckart affirm this to be possible, while Rokitsky, Küchenmeister, Lebert, Bremser, and Rudolphi are as positive on the opposite side.

In the case reported, the author does not admit the possibility of such perforation, believing that the parasite came from the bowel by the fistula

already formed: after the fall of the cord there occurred at first an abscess, then gangrene of the umbilicus, which by extension to the intestine, already attached by inflammatory adhesions, produced the perforation and subsequent fistula.

CACHEXIE PACHYDERMIQUE (MYXŒDEMA) WITHOUT IDIOCY IN A CHILD.

MARFAN and GUINON (*Revue mensuelle des Maladies de l'Enfance*, November, 1893, p. 481) record the history and very complete autopsy of a case of myxœdema in a boy thirteen years of age, traceable back to the seventh year, after an attack of measles and submaxillary abscess. The case is interesting for the absence of idiocy. All of the cases cited in the collection of Bourneville were more or less idiotic; and in the more recently reported experiments of Rehn and Hoffmann (Twelfth Congress of Internal Medicine, Wiesbaden, 1893), with reference to the employment of thyroid extract, the existence of idiocy in the childish patients does not seem to be noted. The intellectual peculiarities of the patient of the authors consisted only in slowness of ideation and feebleness of memory—characteristics quite identical with those observed in the spontaneous myxœdema of adults; whence it seems proven that this latter variety of the disease may occur as well in children as in adults.

The arrest of physical development is appreciable in the following conditions: at thirteen years the height was one metre (about that of a boy of seven years); the genital organs were very little developed, and the milk-teeth were still present, with four of the large molars.

Among the hereditary antecedents, alcoholism in the father and consanguinity in the parents (first cousins) were noted. In addition to the well-known characteristics of the disease, the child was affected with marked dyspnœa and cyanosis of lips and ears, which increased in intensity till death, a week after admission to the hospital.

At the autopsy the thyroid was found to be almost completely atrophied. Among other lesions most carefully described, that of the larynx deserves mention. There was a pachydermic infiltration of the mucous membrane of the larynx, most marked at the aryteno-epiglottic folds. These formed two thick cords, which notably contracted the superior opening of the larynx. Microscopic examination showed that this swelling was due, like that of the integument, to an accumulation of fatty tissue in the submucous layer. This lesion explains the marked dyspnœa noted in this case in the last few days of life. Subjects of pachydermic cachexia, as a rule, show a slight dyspnœa and cyanosis, but in the present case the respiratory disturbance played a predominant rôle, the dyspnœa without modification of the voice resembling that observed in œdema of the glottis. The effects of this stenosis of the larynx were more rapid and fatal from the coexistence of a certain degree of vacuolar degeneration of the fibres of the heart-muscle.

THE OPIUM HABIT IN CHILDREN.

UNDER this title LOUIS FISCHER (*Medical Record*, February 17, 1894, p. 197) reports four cases in detail, out of a total of twenty-two observed, and

draws attention to the complex of symptoms in children caused by what should be more correctly classed as chronic opium poisoning. The drug had usually been administered as enemata of starch water and laudanum, or as paregoric, and the use of it had been begun during an acute illness, usually of diarrhœal character, or had been carried on by mother or nurse for purposes of allaying restlessness and irritability. Three of the cases died despite the most careful treatment and nursing. The author believes that many cases which die, especially in summer, and which are diagnosticated and treated as cases of marasmus, atrophy, athrepsia, or general debility, are possibly cases of opium poisoning simulating these diseases. The symptoms noticed as almost constant were: Diarrhœa, very severe at times, watery, foul-smelling, rarely containing blood, except where severe tenesmus existed; vomiting occasionally, but not a constant factor; anorexia in all cases. Insomnia in all cases. Urine scanty, frequently albuminous, in some very concentrated, containing an excess of phosphates; incontinence of urine frequent. The skin in the beginning normal, rarely pigmented; diaphoresis occasionally. Icterus always late in course. Reflexes very much exaggerated at times; no reaction at other times. Constant irritability, nervousness, and restlessness. The pulse usually full, slow, regular, in beginning 68 to 79; later, very much accelerated and irregular, 140 to 146; heart's action corresponding with pulse, sounds distinct at all times. Respiration deep, slow, at times 18 to 24 in the beginning, 28 to 62 and higher in the later stages. Stupor almost constant, at times coma, but patient could be roused easily and spoke coherently. Itching or formication of skin very probable, judging by the continued scratching and eczematous eruptions found over most of the body, more especially the arms and legs.

The drugs that served best in the sudden or gradual weaning from opium were sulfonal, to promote sleep and overcome restlessness; monobromated camphor (0.2 to 0.5 gm.), followed by 0.5 to 1.0 gm. sulfonal, bromide of potassium and chloral. Hot baths at night and lupuline. Chloralamid, 0.5 to 1.0 gm., at night, was also efficient. Nutrient enemata of starch, wine, egg, and beef-tea and brandy. Several of the cases that recovered are still under observation, but show no symptoms except irritability and nervous twitchings resembling chorea, and in one case persistent albuminuria.

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All communications should be addressed to

DR. EDWARD P. DAVIS, 250 South 21st Street, Philadelphia, U. S. A.

Or

DR. HECTOR MACKENZIE, 59 Welbeck St., Cavendish Sq., W., London, Eng.

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DIAGNOSTIC PALPATION OF THE VERMIFORM APPENDIX.¹

BY GEORGE M. EDEBOHLS, A.M., M.D.,

GYNECOLOGIST TO ST. FRANCIS' HOSPITAL, NEW YORK; PROFESSOR OF DISEASES OF WOMEN AT
THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL.

NOTHING systematic has, to the writer's knowledge, as yet been published regarding diagnostic palpation of the vermiform appendix. The only conditions sought to be established by palpation have been either tenderness on pressure, or the presence of a tumor, or of fluctuation. The idea that the normal or slightly enlarged appendix can, as a rule, be recognized by the touch, previous to opening the abdomen, seems never to have been seriously entertained.

This *à priori* judgment upon the case is, however, founded upon fallacious lines of reasoning and is not at all consonant with the facts. The size of the appendix, its deep situation, and the character of the structures overlying it, have all been deemed insurmountable obstacles to its successful palpation. It is the writer's purpose, in this communication, to show how all these obstacles can be easily and successfully overcome.

The author's practical studies upon palpation of the appendix vermiformis extend back somewhat over a year. It may be added that practically all of his experience has been gained upon women, only three cases of appendicitis in the male having, during that time, come under his observation.

The following methods have been employed in the practical study of the subject:

1. Palpation of the appendix vermiformis in practically every woman whom the writer has had occasion to examine during the past year.

¹ Read before the Medical Society of the State of New York, Albany, February 7, 1894.
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2. Critical palpation of the appendix in every case upon which cœliotomy for any purpose was contemplated, and, when practicable, comparison of the condition of the appendix, as ascertained at the cœliotomy, with that found at previous palpation.

3. Search for the appendix, during a cœliotomy, by palpation from without, and verification of the correctness or otherwise of the finding by the finger within the abdomen.

4. The establishment of the diagnosis, appendicitis, by palpation, with subsequent operation for removal of the appendix based upon the diagnosis thus made.

The practice of palpation of the vermiform appendix as a routine method in the examination of every woman has led to a recognition of the facility with which the appendix may, under ordinary circumstances, be palpated. Such palpation is best performed in the following manner: After completion of the ordinary bimanual examination of the pelvic organs, the woman is drawn upward upon the table to the extent of a foot or so, her feet still remaining where they were placed for the vaginal examination. This is done mainly for the purpose of unfolding the flexure of the thigh upon the abdomen and to render the right inguinal region more accessible to the palpating hand. One hand only, applied externally, is required for the practice of palpation of the vermiform appendix. No assistance can be rendered by a finger introduced into the vagina, and very little assistance, and that only very occasionally, by a finger introduced into the rectum.

The examiner, standing at the patient's right, begins the search for the appendix by applying two, three, or four fingers of his right hand, palmar surface downward, almost flatly upon the abdomen, at or near the umbilicus. While now he draws the examining fingers over the abdomen, in a straight line from the umbilicus to the anterior superior spine of the right ilium, he notices successively the character of the various structures as they come beneath and escape from the fingers passing over them. *In doing this the pressure exerted must be deep enough to recognize distinctly, along the whole route traversed by the examining fingers, the resistant surfaces of the posterior abdominal wall and of the pelvic brim.* Only in this way can we positively feel the normal or the but slightly enlarged appendix; pressure short of this must necessarily fail.

It is just here that the analogy between the conditions necessary for a successful examination of the pelvic viscera, and those obtaining in a *correct* palpation of the appendix vermiformis, becomes apparent. A bimanual examination of the pelvic organs is the only one regarded as satisfactory at the present day; by a vaginal examination alone, or by an external examination alone, we are able to determine nothing of practical value. We need the fingers of one hand to afford a point of counter pressure to

enable the palpating finger or fingers of the other hand to recognize the structures they meet. Just so in palpation of the vermiform appendix. Here the firm posterior wall of the abdomen at this point, the iliac fossa, and the pelvic brim, form a good surface for counter pressure.

Palpation with pressure short of reaching the posterior wall fails to give us any information of value; the soft and yielding structures simply glide away from the approaching finger. When, however, these same structures are compressed between the posterior abdominal wall and the examining fingers they are recognized with a fair degree of distinctness. *Pressure deep enough to recognize distinctly the posterior abdominal wall, the pelvic brim, and the structures lying between them and the examining finger, forms the whole secret of success in the practice of palpation of the vermiform appendix.*

Proceeding in this manner, the appendix is recognized as a more or less flattened, ribbon-shaped structure when quite normal, or as a more or less rounded and firm organ, of varying diameter, when its walls have been thickened by past or present inflammation. When it is the seat of inflammatory changes the appendix vermiformis is always more or less sensitive on pressure; the normal appendix exhibits no special sensitiveness on being squeezed.

A good guide, in searching for the appendix, is formed by the right common and external iliac arteries, the pulsation of which can be easily and plainly felt. The line of these vessels corresponds to a surface line drawn from the left of the umbilicus to the middle of Poupart's ligament. The appendix is generally found almost immediately outside of these vessels. At its base it is separated from the vessels by a space of one-half to one inch, while lower down in its course it generally crosses very obliquely the line of the arteries.

Theoretically, two conditions mainly militate against the successful palpation of the appendix vermiformis after the method above described; practically, the difficulties offered by these two conditions amount to very little or nothing. I refer to the variable location of the appendix and to the fact of its common deep situation behind the cæcum.

With the very rare exceptions of its situation *far* away from its usual site, the origin of the appendix vermiformis is practically always found at what is known as McBurney's point. In fact, it is this constancy of the situation of the appendix which gives its practical value to McBurney's point in the diagnosis of appendicitis. The tenderness elicited by extremely localized pressure at McBurney's point is due to the presence beneath the finger of the inflamed appendix—a fact of which I have had abundant opportunity to satisfy myself.

The origin and first part of the appendix are practically, then, constant in situation, or so nearly so as not to interfere materially with the working rule: to first search for the appendix at McBurney's point. Any

deviations from its usual course, starting from this point, can be usually recognized by the examining fingers. Only that part of the appendix, however, situated above the level of the pelvic brim can be distinctly recognized by the finger. When the appendix in its course dips down into the pelvis, that part of it lying below the pelvic brim is recognized, if at all, only with great difficulty. The surface for counter pressure is lost below the iliac fossa.

The second condition commonly assumed to render successful palpation of the appendix vermiformis impracticable, if not impossible, is a time-honored, traditional myth. I refer to the assumed constant or common filling of the caput coli with fecal matter. In my own experience this condition is *very* rare; in fact, I cannot recall a case, during the period of over a year in which I have systematically practised palpation of the vermiform appendix, in which I have found it. In quite a number of emergency cœliotomies, in which no opportunity was afforded for previous catharsis, I do not recollect ever to have found a fecal impaction in the caput coli. Indeed, the systematic practice of palpation of the vermiform appendix, after the method described, gives us in addition a great deal of information about the cæcum. We generally find it empty, collapsed upon itself from before backward, with the inner and outer borders distinctly recognizable by the fingers as they pass over them. The appendix, being in the large majority of all cases situated behind the cæcum, is of course palpated *through* the apposed anterior and posterior walls of the caput coli.

The second manner in which the study of the subject has been pursued has been by especially careful and critical palpation of the appendix in every case in which a cœliotomy was contemplated. When feasible the appendix was again examined on the occasion of the cœliotomy, and its actual condition compared with that previously diagnosticated by palpation. With very rare exceptions, we found our previous diagnosis of the position and size of the appendix correct.

In five cases in which cœliotomy was undertaken upon other indications, a diseased appendix, previously diagnosticated as such by palpation, was removed at the same time. The operations combined with the ecphyadectomy in these cases were: salpingo-oöphorectomy for chronic salpingo-oöphoritis in the first; removal of two pus tubes in the second; salpingo-oöphorectomy and ventral fixation of the uterus, combined with plastic operations, for total prolapsus of uterus and vagina in the third; total extirpation of the uterus for fibromata in the fourth and fifth.

The third method of study, which has been pursued during the past two months only, has been found exceedingly satisfactory and instructive. After completing the intra-abdominal operation or operations for which a cœliotomy is undertaken, and before closing the abdomen, the appendix is located by palpation from without. While the palpating

finger presses the integuments down upon the appendix from without, thus marking its location as felt, and holding it down against the posterior abdominal wall, two fingers of the other hand are passed within the abdomen to verify or disprove the presence of the appendix immediately underneath the palpating outer finger. In the comparatively few tests thus made I have never failed to locate the appendix exactly and to diagnosticate correctly both its thickness and direction.

Finally, in a fourth series of three cases of chronic and one of acute appendicitis, the diagnosis was positively made by palpation, and coeliotomy was performed *solely* for the purpose of removing the diseased appendix. These four cases are additional to the five already mentioned when discussing the second method—in which the diseased appendix was removed as a secondary or additional measure when performing coeliotomy for other purposes. The acute and two of the chronic cases of appendicitis were successfully operated upon by myself. The third case I turned over to my colleague, Dr. G. F. Shrady, for operation, after making the diagnosis of chronic appendicitis by palpation.

In reference to this case Dr. Shrady writes (*Medical Record*, January 6, 1894, p. 2):

"In this connection I may state that my attention has been called by Dr. Edebohls to the possibility of diagnosing recurrent appendicitis by actually feeling the appendix through the abdominal wall, and demonstrating the cause of tenderness by direct pressure upon the organ. In one case I was able to do this, to recognize the appendix rolling under the fingers, to limit tenderness to direct pressure upon the process, and afterward to remove the organ by operation from that exact locality."

And again (*ibid.*, p. 23) in summing up the discussion upon his paper :

"He had expected someone would question the diagnosis of the appendix by touch through the abdominal walls, for he had not supposed this possible until it had been suggested to him to make steady pressure until resistance was encountered from the posterior walls, when, if the appendix were present in that locality, it might be felt as a cord rolling under the finger. Probably this would be possible only where the appendix was turgid and bulbous, as it was in one case in which he mapped out its location, and on cutting down found it directly under the mark made on the abdominal wall, about two inches and a quarter from the anterior superior spine, in line with the umbilicus."

It needs but a fair, unprejudiced trial of the method of palpation of the appendix vermiformis as described to convince others, as Dr. Shrady has been convinced, that it is possible to diagnosticate chronic appendicitis by palpation. The members of the house staff of St. Francis' Hospital, who have worked with me during the past year have, by repeated practice, become expert in this method of examination.

It is within the memory of possibly each one of you that not ten years ago the man who claimed to be able, as a rule, to recognize and map out by bimanual examination the normal Fallopian tubes was looked

upon with suspicion. Where to-day is the gynecologist who cannot do this? And yet palpation of the appendix vermiformis, after a little practice, becomes quite as easy, if not easier, than palpation of the Fallopian tubes. Indeed, I would lay it down as an axiom that successful palpation of the appendix vermiformis, except in cases of acute appendicitis, is possible in all female patients in whom the absence of excessive stoutness, abnormal rigidity of abdominal walls, or other more exceptional unfavorable conditions, permit us to accurately define by bimanual palpation normal-sized Fallopian tubes.

The practical importance of palpation of the appendix vermiformis is apparent at a glance. Chronic appendicitis in the future is to be diagnosed, not on subjective symptoms but on objective signs. Unless, in cases of suspected chronic appendicitis, the surgeon can recognize by palpation the thickened appendix, and limit tenderness on pressure to the diseased organ, he will not be justified in operating. A strict observance of this rule will prevent in future a not infrequent error of the past, that of performing a cœliotomy for appendicitis, only to find the appendix perfectly healthy.

One broad rule governing the question of operative interference in appendicitis should be: not to operate in chronic cases unless you can feel the diseased appendix, nor in acute cases unless by palpation you can recognize either the diseased appendix or the presence of a tumor. Anæsthesia may be necessary, in exceptional instances, to decide the question.

Palpation of the appendix vermiformis possesses practical importance in the *early stages* of acute appendicitis, at the time of operation, apart from its value as a diagnostic measure. In two instances in which I have operated early for acute appendicitis—in one on the second, in the other on the third day of illness—nothing but a small tumor could be felt in the right inguinal region before the patient was anæsthetized. After full anæsthesia, the inflamed, enlarged appendix could be distinctly felt in both cases. This enabled me to make the incision *directly over the diseased organ*, and thus to remove the strangulated appendix with greater facility and through a smaller opening than if the incision had been made farther away.

In conclusion I may remark that I have on two occasions forestalled an operation for supposed chronic appendicitis, proposed by eminent surgeons, by being able to recognize a normal appendix by palpation, and on this finding to advise against operation.

URÆMIC HEMIPLEGIA.¹

BY REYNOLD W. WILCOX, M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; ATTENDING PHYSICIAN TO ST. MARK'S HOSPITAL.

It would seem that in view of the increasing number of reported cases of hemiplegia, which even a cursory search of medical literature discovers, where the paralysis subsequently completely disappears, that a careful study of uræmia as a causative factor should be undertaken. Yet we find that this condition has been denied by such authorities as Addison and Bright in England, and by Lécorché, Sée, and Lasèque in France. That such cases have existed and have been recognized, is evident, for in many cases the "serous apoplexy" of the older writers is capable of no other interpretation. Finlayson notes that hemiplegia may complicate pregnancy and pass away after labor, and that the urine is almost always albuminous. The stumbling-block to the appreciation of uræmia as a valid cause has been that we have a paralysis without an apparent lesion, a symptom *sine materia*. Yet the cases reported, even since 1880, by Charpentier, Pätsch, Jäckel, Raymond, Chantemesse and Tenneson, Bernard, Lancereaux, Level, Chauffard, Dreyfus-Brisac, Florand and Canniot, Lloyd, and Dercum, are not susceptible of other explanation. It has been demonstrated to exist by Leyden and Leichtenstern. The convincing papers of Massalongo in Italy in 1889 and Boinet in France in 1892 leave but little for complete conviction.

The physiology of this condition has been admirably shown by the experiments of Raymond, in 1885. On removing the left superior sympathetic ganglion of a rabbit, convulsions occurred in the right side of the body, which corresponds to the side of the brain in which the circulation was affected by the operation. Later the hilum of the kidney was ligated. On repeating the experiment with the right superior cervical sympathetic ganglia, the convulsions were limited to the left side of the body. On necropsy there was found in both instances a diffused bilateral cerebral œdema, the explanation apparently being that in excising this ganglion there occurs a vasomotor paralysis of the vessels of the head, the brain and its membranes, with vascular alterations. At the moment when the vessels have lost their tonicity, if the renal secretion be suppressed by ligation of the hilum, a dyscrasic cause is added to the lessened resistance of the hemispheres, and œdema will be more pronounced on this side, and here will be found the greatest effect of the uræmic intoxication. Or, in other words, the two halves of the nervous

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system under these conditions possess unequal powers of resistance, and the weaker yields.

The pathology, however, is not quite so evident as the preceding experiments would indicate; because, as it seems, our knowledge of the pathology of uræmia is by no means complete. That a bilateral diffuse œdema should result in unilateral paralysis, is in many cases difficult of belief; and, as Dercum has pointed out, there may be no more œdema on one side of the brain than upon the other. In the cases of Leichtenstern and Charpentier, however, the œdema was accurately localized. Then, again, as in cases of Level, Chauffard and Lancereaux, and of Lloyd, there may be no œdema found on necropsy. Or, if the œdema is found, it may not exist where it is expected, as in a case reported by Charpentier, where it was on the side of the brain opposite to the one which would account for the paralysis. However, Lancereaux has found both cerebral œdema and as well ventricular dropsy. Massalongo points out the resemblance of this paralysis to that caused by other general intoxications, as of lead, carbonic dioxide, carbon bisulphide, arsenic, and mercury, as evidence that a general cause may produce a localized paralysis. Indeed, the evidence is present that a diffuse, symmetrical œdema may be the cause of unilateral, asymmetrical paralysis. In diabetes we may seek further for an analogy (the cerebral dehydration of Bouchard), and finally in the auto-intoxicants, as acetonæmia, hypoglycæmia, oxybutyricacidæmia, may the complete explanation be found. If hemiplegia be not exclusively dependent upon cerebral œdema, we are obliged to admit the action of toxic urinary products and ptomaines upon the nerve centres. In spite of all this, we believe that the case of Dreyfus-Brisac is a strong argument in favor of a theory which gives to serous œdema a firm position in the pathology of uræmic manifestation. The localization or greater intensity of circulatory troubles in the brain may be explained by the analogues of the sudden œdema of eyelids or errant foyers of pulmonary congestion, by no means uncommon in patients suffering from uræmia. In the cases of Boinet and Jäckel the hemiplegia with hysteriform anæsthesia could only be explained by a sudden fugitive and temporary œdema of the brain which predominated in the cortical motor zone of the left hemisphere. Raymond sums up by stating that the cerebral circulatory troubles may be congestion or anæmia, but in their last analysis it is an *anoxyhémie* of the brain. Raymond believed that atheroma was the connecting-link between uræmia and localized paralysis. However, Chantemesse reported three cases in which no lesion of the vessels was found, one of them at the age of thirty-five, and Lloyd's case was only seventeen, and this has also been noticed by Chauffard and by Level. The heart has been found to be slightly hypertrophied by Pätsch, who remarked in both of his cases arterio-capillary fibrosis. The kidneys

show interstitial nephritis (Lloyd's case, seventeen years old, a chronic sot, the pig-backed kidney), or chronic parenchymatous nephritis with atrophy (Pätsch).

The clinical histories of the reported cases present great uniformity of symptoms and signs. Careful questioning is important that the existence of prodromal symptoms shall be clearly established, for upon the presence of these symptoms (and they are rarely absent) is placed great dependence in the diagnosis.

As symptoms :

1st. Vertigo, often slight.

2d. Gastric symptoms, nausea unrelieved by stomachic medication, vomiting apparently without cause.

3d. Cardiac: if it be isolated hypertrophy of left ventricle, it should be remembered that this predisposes as well to cerebral hemorrhage.

4th. Localized œdema of face, eyelids, patches in lungs.

As signs :

1st. The urine is likely to be albuminous before the hemiplegia appears. If it is only discovered afterward this symptom loses much of its significance, for it is often found in hemiplegia from hemorrhage or softening.

2d. Persistent low specific gravity of the urine is important, and casts, if found, will do much to aid in forming an opinion.

3d. If only hyaline casts are present, the general import of the urinary findings is increased, for in contracted kidney these may be the only casts present.

4th. If atheromatous changes are apparent, it may be suspected that the cerebral arteries present the same changes.

5th. If albuminuric retinitis is present, as is rarely found, there is great probability that this is the origin of the hemiplegia.

The cardinal symptom of the attack itself is the sudden attack of hemiplegia, which may or may not be complete. The patient frequently, although not always, becomes comatose, with stertorous respiration. As the patient comes out of the condition the paralysis may be markedly relieved, or it may persist for several days with the same intensity. It may even change sides, as Lancereaux has observed. It may be followed by contractions which are localized in the adductors of the opposite thigh, or in the non-paralyzed arm as was seen by Raymond. The accompanying facial paralysis is of central origin and involves only the inferior facial, and is of the side corresponding to that of the body in five cases reported by Jäckel, Raymond, and Chantemesse. In the three cases of Bernard, Raymond, and Level, the face was not involved. Ptosis is exceptional, a single case of Raymond being the only one hitherto recorded. The morning hemiplegia may be complete, but it may be relieved and may disappear by evening. Aphasia has been

observed in six cases (Level, Bernard, Raymond, and Lancereaux) coinciding with right hemiplegia. The hemi-anæsthesia is presumably of cortical origin, often less complete and more transitory than the motor paralysis. It may be sensorial, as in Raymond's case and in Boinet's (deafness), or it may invade the entire surface of the body (Raymond). It is usually proportionate to the loss of power. If coma is marked there may be a relaxation of all the members and the hemiplegia may be ascertained only as consciousness is restored. At the onset convulsive phenomena are frequent, a hemi-epilepsy or a hemi-eclampsia, especially in the part which later becomes paralyzed. Jacksonian epilepsy, if present, is important in diagnosis. Conjugate deviation of the head and eyes is not uncommon. Generally the deep reflexes are diminished or abolished, but rarely are they exaggerated. Superficial reflexes are usually impaired. The pulse may be small, but is not likely to be hard or slow. The temperature was elevated in Chantemesse and Tenneson's cases even to 104° F. Unilateral deafness has been described by Bright and Barlow, Addison, Lasèque, Routh and Goeles, Dieulafoy, Tissot, Dommergue, and Gurnowitch, and which persisted several weeks. In Boinet's case this deafness lasted three weeks. For five days an amnesia, similar to that which follows eclampsia and carbon dioxide intoxication, persisted in Boinet's case. The pupils are not usually contracted (they were not contracted in Boinet's case); but if they are, hemorrhage and softening are not excluded.

SEQUELÆ.—The motor troubles disappear, the sensory conditions return, and recent contractures are rare—equally so are late ones. The tendon reflexes of the disabled side may become normal, or, as in my case, exaggerated.

The differential diagnosis is important, but, as was shown by Florand and Canniot in one case, it may be impossible. The hemiplegia from cerebral hemorrhage presents many points of similarity. The distinction can be made in that it is apt to cease after the coma, and that it rarely persists for several days with great severity; after a time the uræmic hemiplegia disappears in part or as a whole. Or if another uræmic attack supervenes, the paralysis may be upon the same or the opposite side, nor is it so complete or permanent as in cerebral hemorrhage. The important characteristics are the antecedents of the person, the variability and mobility of the paralysis, the presence of albumin, and the low specific gravity of the urine. There is nothing distinctive about the coma or the slow and stertorous breathing. The paralysis in both instances may be preceded by unilateral convulsions resembling those of an irritative lesion of the psycho-motor zone of Jackson, Bravais, and Charcot. These convulsions may be clonic, rhythmical, often limited to members which later become attacked by paralysis, or they may be both clonic and tonic at the same time. Leichtenstern

attributes these convulsions to localized œdema. Rigidity of limbs or local muscular twitching in paralyzed limbs is in favor of uræmia.

Although both Addison and Lasègue deny the existence of a distinctive uræmic temperature, yet the low temperature so frequently found is a help in diagnosis. Gowers says that in uræmia the temperature is always subnormal except when local influences exist. Yet we do not obtain the profound alterations in temperature which have been so carefully described by Dana—the marked initial fall, the gradual rise of the first three or four days to normal or slightly beyond—nor indeed the slightly higher (one-half to two degrees) temperature in the paralyzed side, nor is it normal on the paralyzed, the subnormal being on the sound side. Perspiration is more likely to be present in cerebral hemorrhage. Nor are we so likely to have the abundant urine of low specific gravity in uræmia, while albumin and casts are far more frequent. The condition of the deep reflexes, abolished immediately after shock, soon returning and becoming exaggerated on the paralyzed side, may be alike in both instances. But there is not so likely to be inequality in the size of the pupils as in hemiplegia from hemorrhage, nor so great failure to respond to light. If the pupils are normal or dilated we should consider uræmia. But on the other hand we must remember that renal disease is found in one-third of all cases of cerebral hemorrhage (Eskridge), and it should also be borne in mind that the hemorrhage may be due to syphilis.

The mobility of the paralysis recalls that due to cerebral softening from thrombosis—complete in the morning, it diminishes in the evening and again increases some hours after. Myosis is not a valuable sign, as it occurs in both. Aphasia in right-sided paralysis has only a negative value. The temperature, if elevated, may be due to local conditions in uræmia. If lowered, it points toward uræmia, but not so strongly as against hemorrhage, for according to Dana, the initial fall in softening from thrombosis or embolism is rare, and if the temperature be taken in the rectum it is of short duration. If subnormal temperature exists it is only in the non-paralyzed side, and there is a slighter tendency to irregularity in both sides and a slower rise if it does occur. But if secondary inflammatory symptoms occur the temperature is well marked (Eskridge), and so this fact would be against uræmia. The urine may also be albuminous, but is not so likely to contain casts as in uræmia. The condition of the heart, which is likely to be feeble, dilated, and irregular, may aid in the diagnosis of softening; the arterial degenerations are common in both.

It does not seem necessary that the differential diagnosis between uræmic hemiplegia and tubercular meningitis or hysteria or epilepsy should be given, as the mistake ought not to be made, but as writers have called attention to these conditions it is well to bear them in mind.

In general, the fugitive premonitory symptoms, localized oedema, pallor, headache, dyspepsia, the variability and mobility of the paralysis, which may or may not be preceded by Jacksonian epilepsy, the urinary conditions, the temperature curve, and finally the complete cure, suffice for a clearly cut diagnosis.

The prognosis is generally very grave, naturally depending chiefly upon the renal lesion. An elevation of temperature to 104° F. is always of unfavorable portent. In Boinet's case it remained normal; in Chantemesse's case, which recovered, it never rose above 100.4° F. Myosis and conjugate deviation of eyes and head are of grave omen. In the majority of cases of death these three symptoms have been present. The amelioration of the uræmia marks the decline of the hemiplegia. So far as the hemiplegia itself is concerned, total recovery is the rule.

TREATMENT.—If the general condition permits, bleed (Boinet's case to 400 grammes, which caused the coma and hemiplegia to disappear). This takes out urea in the proportion of 2.43 per mille, with toxic urinary products and ptomaines, and as well relieves the vascular troubles and cerebral oedema which Raymond, Chantemesse, Florand, and Canniot have habitually found in autopsy. Drastic purgatives may be useful: elaterin, jalap with cream of tartar, croton oil in emergency; or purgative clysters, concentrated glycerin, Epsom salt enema. Diuretics may be indicated, as theobromine; and diaphoretics, as pilocarpine, if the heart be carefully watched. Digitalis has been recommended if the stomach bears it, but preferable is strophanthus or sparteine. Adonidine as a substitute should be borne in mind. Milk for nourishment should be insisted upon. Steam baths are occasionally of use. For convulsions bromide of potassium and chloral are indicated.

In the following case the diagnosis of uræmic hemiplegia was made:

J. M. W., of New York, aged seventy-five years, bachelor, living at leisure, of Scotch ancestry, had always enjoyed good health. His parents died at an advanced age, and an only sister of epithelioma late in life. In the spring of 1892, while descending a stairway in a hotel, he became dizzy, fell, and was taken to a hospital while unconscious, in an ambulance. He recovered within a few hours and was able to return unaided to his home a few blocks distant. While in the hospital, a house physician with more medical ardor than notions of cleanliness, drew off his urine with a catheter. As a result he suffered from a severe attack of cystitis which was treated by several surgeons—internal treatment, washing out of the bladder—with indifferent success. The summer was spent at Saratoga, where his general health improved, but the condition of the bladder remained stationary. During the fall the cystitis was cured, and beyond an occasional single call to urinate at night, he suffered no inconvenience. When the pus, epithelium, and bacteria had been removed from his urine, analysis showed that the amount varied from forty to forty-five ounces in the twenty-four hours, was always of light color, transparent, of normal odor, specific gravity 1012–1016. It never con-

tained albumin nor sugar, and very rarely a slight indication of bile. The urea was generally diminished; occasionally the uric acid was increased, but as a rule there was diminution of both the alkaline and earthy phosphates, and of the chlorides. The sediment consisted almost entirely of a few stray epithelial cells, chiefly from the bladder, and a few leucocytes. Although not in good flesh, he had fine color, was able to walk without fatigue, and in general considered himself well. He did not use nor had he ever used alcohol in any form; he indulged sparingly in tobacco. There was no *arcus senilis*, no pulmonary signs beyond a slightly roughened respiration in mid-chest. His pulse was of fair breadth but of increased tension, yet compressible, generally of the rate of 66 to 70; the aortic second sound was accentuated, and the first sound, somewhat shortened, was loud and rather metallic in quality. He was able to read his newspaper with a convex glass of only three-quarters of a dioptré. There were no visual or dyspeptic symptoms, no œdema nor other urinary symptom. At his dinner on the evening of January 24th he partook of a considerable quantity of indigestible food. He was found by his valet early in the morning of the following day, unconscious; I saw him a few hours later. He had passed urine in bed involuntarily. The body surface was dry, the skin was cool to the touch; with the exception of the upper right arm the muscles of the entire left side of the body were flaccid. The upper arm extensors and flexors were alternately contracting, which kept the arm in slow motion in an arc of six to eight inches, the contraction of the deltoid carrying it slightly outward. The deep reflexes were absent on both sides; the skin reflexes difficult to obtain. Pricking with the sharp point of a Carroll's æsthesiometer was not followed by contraction. The pupils were in mid-dilatation, but responsive to light, no strabismus nor deviation; the left side of the face was flaccid, with ptosis of left eyelid; left angle of mouth was moving with the stertorous respiration and the saliva freely pouring from the angle. On speaking loudly he became sufficiently conscious to partially protrude his tongue, which deviated to the left. He did not, however, open his eyes, although the right was slightly open. The respiration was 19, stertorous; temperature 97.3° in both axillæ. During the day the motion of the left upper arm ceased; consciousness was partially re-established, when it was found that swallowing was possible, although with some difficulty, and the temperature rose to 99.1° by night, and was then, as it proved to be throughout his entire illness, the same in both axillæ. During the afternoon the patient became confused and flighty, and late in the evening was bathed in warm perspiration.

Examination of urine. Quantity, 16 ounces; specific gravity, 1012; reaction, acid; color, pale; odor, normal; cloudy; appearance of sediment, flocculent; albumin, $\frac{1}{2}$ of 1 per cent. by weight; sugar, absent; bile, trace; blood, none; casts, few hyaline casts; pus, none; bladder epithelium.

January 26. Pulse 66, of the same character; respiration and temperature as at night; had spent a somewhat restless night, but yet slept at intervals. The paralysis of the face was much less marked; articulation was fairly distinct, but the deviation of the tongue was pronounced. The paralysis of the left side of the body was marked; no evidence of motion, even on puncture, excepting a fibrillary twitching of the upper arm muscles. Superficial (skin) reflexes exaggerated, and both tendon reflexes were obtained with difficulty. The temperature rose half a

degree during the day, and at night the paralysis of the body was still profound.

Examination of urine. Quantity, 33 ounces; specific gravity, 1014; reaction, acid; color, pale; odor, normal; cloudy; appearance of sediment, flocculent; albumin, $\frac{1}{2}$ of 1 per cent. by weight; sugar, none; bile, slight amount; phosphates, increased; casts, a very few hyaline; bladder epithelium.

27th. The paralysis became very much worse during the night, so pressure could not be made by the left hand. The patient was irritable, but could speak with considerable distinctness; the temperature was 99°; pulse 70, of less tension and quicker; respiration 20. The pupils are now of normal size, responsive to light. The skin is moist, and besides a slight drooping of the left angle of the mouth, there is little to be seen; the ptosis has disappeared. In the evening the facial paralysis was relieved to a slight extent, that of the body being less marked. No evening elevation of temperature.

Examination of urine. Quantity, 35 ounces; specific gravity, 1014; reaction, acid; color, yellow; odor, normal; slightly cloudy; appearance of sediment, flocculent; albumin, $\frac{1}{2}$ of 1 per cent. by weight; sugar, absent; bile, absent; phosphates, normal; casts, very few hyaline and some finely granular; bladder epithelium.

28th. Without other change in the general condition, the paralysis of the leg appeared to be much more marked, and the tendon reflex of both sides was normal. Temperature 98.8°; pulse as before. Dynamometer: right 37, left 11. Paralysis less marked in the evening.

Examination of urine. Quantity, 34 ounces; specific gravity, 1010; reaction, acid; color, yellow; odor, normal; clear; appearance of sediment, slightly flocculent; albumin, $\frac{1}{2}$ of 1 per cent. by weight; sugar, none; bile, none; phosphates, normal; casts, very few hyaline; epithelium, few bladder cells.

29th. The paralysis of face has entirely disappeared; the tongue-tip on protrusion is almost in the middle line; the intellectual faculties as before the illness, with the addition of considerable impatience. The tendon reflex of left side is exaggerated, that of the right normal. Dynamometer: right 37, left 14. The paralysis of the leg has markedly improved, that of the arm less so. In the afternoon the usual progressive gain of power.

Examination of urine. Quantity, 36 ounces; specific gravity, 1015; reaction, acid; color, pale yellow; clear; appearance of sediment, slightly flocculent; albumin, $\frac{1}{2}$ of 1 per cent. by weight; sugar, none; bile, none; casts, none found; epithelium, bladder cells.

30th. This morning the temperature is normal, and the patient appears brighter; the knee-jerk on left side more active; right, normal; paralysis is less marked than yesterday; sleep has been fair. In the evening the paralysis is somewhat better.

Examination of urine. Quantity, 39 ounces; specific gravity, 1012; reaction, acid; color, pale; clear; appearance of sediment, slightly flocculent; albumin, $\frac{1}{2}$ of 1 per cent. by weight; sugar, none; bile, none; uric acid, diminished; casts, none; epithelium, few bladder cells.

31st. A marked improvement in all symptoms. Dynamometer: right 38, left 19. Superficial reflexes normal; tendon reflexes as before. Evening improvement slight. The temperature, respiration, and pulse normal.

Examination of urine. Quantity, 36 ounces; specific gravity, 1014; reaction, acid; color, pale; clear; appearance of sediment, slightly flocculent; albumin, $\frac{1}{2}$ of 1 per cent. by weight; sugar, none; bile, none; casts, none; epithelium, few bladder cells.

February 1. But little change, and that in the line of improvement. Pulse is 66, broader, and tension less marked.

Examination of urine. Quantity, 45 ounces; specific gravity, 1015; reaction, acid; color, pale; odor, normal; clear; appearance of sediment, slightly flocculent; albumin, $\frac{1}{2}$ of 1 per cent. by weight; sugar, none; bile, none; casts, none; slight amount of bladder epithelium.

2d. Steadily improving.

Examination of urine. Quantity, 47 ounces; specific gravity, 1016; reaction, acid; color, pale; odor, normal; clear; appearance of sediment, slightly flocculent; albumin, $\frac{1}{2}$ of 1 per cent. by weight; sugar, none; bile, none; casts, none; slight amount of bladder epithelium.

4th. Dynamometer: right 37, left 26; paralysis slight both morning and evening; upper arm and leg muscles but little affected; finer motions of hand are difficult, resulting in much trembling.

Examination of urine. Quantity, 49 ounces; specific gravity, 1012; reaction, acid; color, pale; odor, normal; clear; appearance of sediment, slightly flocculent; albumin, trace; sugar, none; bile, none; uric acid, normal; casts, none; small amount of bladder epithelium.

6th. Sits up in chair; but little trace of illness, excepting pallor and slight loss of power in left hand.

Examination of urine. Quantity, 51 ounces; specific gravity, 1017; reaction, acid; color, slightly pale; odor, normal; clear; appearance of sediment, slightly flocculent; albumin, trace; sugar, none; bile, none; urea, normal; uric acid, normal; chlorides, normal; casts, none; bladder epithelium.

9th. Patient is steadily improving.

Examination of urine. Quantity, 53 ounces; specific gravity, 1013; reaction, acid; color, slightly pale; odor, normal; clear; appearance of sediment, slightly flocculent; albumin, none; sugar, none; bile, none; urea, diminished; uric acid, normal; chlorides, normal; phosphates, slightly diminished; casts, none; small amount of bladder epithelium.

21st. Walks with aid of attendant; left foot drags slightly, although he can stand alone. Urine now as before illness. Appetite good and sleep undisturbed but once for urination. General appearance good.

The treatment in this case consisted in a preliminary purgation with $\frac{1}{2}$ -grain doses of elaterin, repeated every two hours until free evacuation of the bowels was obtained. Nitroglycerin, $\frac{1}{100}$ grain, or the nitrate of soda, 1 to 2 grains, with sulphate of sparteine, $\frac{1}{4}$ grain, and the sodio-benzoate of caffeine, 2 to 5 grains, was administered according to the indications as found in the heart and kidneys. During convalescence, the phosphate, 40 grains, and bicarbonate of soda, 15 grains, was given in a glass of hot water on rising in the morning, and $\frac{1}{20}$ of a grain of nitrate of strychnine before each meal.

Within two months the only indication of the illness through which he had passed was a slight exaggeration of the tendon reflex of the left (formerly paralyzed) leg.

CONCLUSIONS.—1. Uræmic hemiplegia is a distinct form and should be recognized as such.

2. The peculiarities are its mobility, variability, and complete recovery.

3. The diagnosis rests upon antecedent history, condition of the urine, and temperature curves.

4. The dominating factor in treatment is the uræmia.

706 MADISON AVENUE.

THE EFFECT OF MASSAGE ON THE NUMBER AND HÆMOGLOBIN VALUE OF THE RED BLOOD-CELLS.

BY JOHN K. MITCHELL, M.D.,
OF PHILADELPHIA.

DURING several years past, while using massage a great deal in various diseases, I have often wished to find some additional way of accounting for the rapid improvement of color and nutrition which is seen under its application in patients anæmic from various causes, rather than the usual vague suggestion of hastened circulation and accelerated tissue change.

In pursuit of this object, in the autumn of 1893 I made some examinations of the blood of patients before and after massage. The first results were so astonishing that I reported them briefly to the College of Physicians of Philadelphia, in December last, and proceeded to a wider and more systematic study. The sum of the conclusions drawn from this extended observation is here presented.

After this investigation was begun I found a paper by Professor Winternitz,¹ which had previously escaped my notice, on the change in the number of red and white blood-corpuscles under hydrotherapeutic procedures. The article was interesting and suggestive, but did not take up the detailed examination of blood before and after massage.

In a "Preliminary Note" in the *Medical News* of December 23d, a brief account was given of a few of these studies upon the effect of massage as evidenced in the blood. The facts are so remarkable, the clinical conclusions which may be drawn from them of such widespread use and value, and the deductions which at once suggest themselves so revolutionary, so subversive of established views both in diagnosis and therapeutics, that the work has necessarily extended itself far beyond the limits originally proposed. I shall endeavor here to summarize the experiments made, to indicate the more important information acquired

¹ "Neue Untersuchungen ü. Blutveränderungen nach thermischen Eingriffen." *Centralblatt f. inn. Medicin*, 1893, No. 49.

from them, the far-reaching possibilities which are hinted at in some of them, and the questions in the physiology and pathology of the blood which they suggest.

The cases were thirty-five in number; several of them were examined a number of times, but, in order to exclude as far as possible the element of different individual susceptibility to the treatment, few were used more than twice. The diseases from which they were suffering included every variety of disorder affecting the integrity of the blood, except the severe acute fevers and malignant infections: simple anæmia, both slight and severe, chlorosis, anæmia from hemorrhage, from several toxic causes, from senile and other malnutritions, and at least one case in which the diagnosis of pernicious anæmia had been made by competent observers. This diagnosis was partially verified by the death of the patient without other symptoms than those of progressive anæmia,¹ although no post-mortem examination was obtained. Another case of very extreme anæmia, at first thought to be of pernicious nature, is still under observation, and at present much improved. A number of trials were also made on persons in whom there was no evident anæmia, and several on individuals in perfect health.

As will be seen from the examination of the tables, the results were uniformly upon the side of increase, except in three cases. The increase in some was very small, but the *tendency* seems always to have been in that direction. In two of the three persons whose count was lessened after massage, active exercise had been taken just previous to the count. One had walked about two miles and a half before the examination, upon a very cold day, in the teeth of the wind; the other had walked half a mile to a country station, come ten miles in the train, and then walked half a mile in town again immediately preceding the examination. In both of these there was marked diminution of the number of red globules after the application of massage, but these cases cannot be considered as contradictory of the results obtained in disease. They had already a greatly increased activity of circulation, and the rest as well as the rubbing had a share in the reduction. The third (Case VII.), by a nurse's mistake received his dinner after the completion of his massage and before the count was begun, which may have interfered with the full and usual effects of the manipulation. Previous and subsequent estimations gave decided increase.

It should be added that great care was used in ascertaining the relation to meals of the hour of examination, as it is well recognized that the corpuscles are increased during the active process of digestion, and, where the time was near a meal, the fact is mentioned in the tables.

¹ Dr. John H. Musser, in whose care this patient was, states that he would prefer to make a diagnosis of "severe anæmia from atrophy of the gastric mucous membrane," as the reduction of the corpuscular elements was not very great.

EFFECT OF MESSAGE UPON THE BLOOD.

Case.	Observation	Age.	Sex.	Disease.	Before message.			After message.			Remarks.
					Red blood-corpuscles.	White blood-corpuscles.	Hemo-globin-value.	Red blood-corpuscles.	White blood-corpuscles.	Hemo-globin-value.	
I.	1	25	M.	Healthy	5,675,000	.....	110	7,950,000	.....	120	Hospital interne.
	2	...	...	Same subject	5,650,000	.....	110	8,125,000	.....	120	"
II.	3	26	M.	Healthy	5,800,000	.....	110	5,150,000	.....	110	Count made after a sharp walk on a cold day.
III.	4	25	F.	Subacute rheumatism	7,100,000	15,000	80	8,012,500	25,000	80	Negro servant.
IV.	5	43	F.	Sciatic neuritis.	5,800,000	.....	85	7,000,000	.....	85	Physician; rest treatment for sciatica.
V.	6	45	F.	Hemiplegia (attack 18 days previous)	5,325,000	.....	64	5,610,000	.....	70	Half-hour's massage.
	7	...	...	Same subject	5,500,000	.....	62	8,133,333	.....	70	One hour's massage.
	8	...	...	"	4,000,000	.....	74	6,220,000	.....	78	See also Obs. 50-57.
	9	...	...	"	5,425,000	.....	.....	5,500,000	.....	.....
	10	...	...	"	5,012,500	12,500	65	6,675,000	12,500	75	
	11	...	...	"	5,187,500	.....	65	8,800,000	.....	70	
VI.	12	38	F.	Neurasthenia, chronic gastritis	4,660,000	.....	.....	5,866,666	.....	.....
VII.	13	63	M.	Hemiplegia (attack 10 weeks prev.)	5,050,250	.....	70	6,725,000	.....	75	By a nurse's mistake received dinner after massage and before last count was made.
	14	...	...	Same subject	5,122,500	.....	65	7,210,000	.....	67	Several months in hospital under massage and good diet.
	15	...	...	"	5,000,000	12,500	70	4,540,000	12,500	70	"
VIII.	16	16	M.	Transverse myelitis (recovering)	6,900,000	.....	90	8,100,000	.....	100	Same as above.
IX.	17	22	M.	Locomotor ataxia (doubtful)	6,575,000	.....	110	7,310,000	.....	110	"
X.	18	16	M.	Anterior poliomyelitis (improving)	5,200,000	.....	110	7,400,000	.....	110	"
XI.	19	37	F.	Hysterical delusions, mild melancholia.	5,400,000	.....	80	5,160,000	.....	80	Had been 4 weeks under rest, massage, and full feeding when examined.
XII.	20	40	F.	Neurasthenia	5,150,000	.....	75	5,500,000	.....	75	Appearance highly anemic; massage three quarters of an hour.
XIII.	21	...	F.	"	5,150,000	.....	70	5,500,000	.....	70	Four weeks' rest, massage, and full feeding.
XIV.	22	22	F.	Simple anemia	4,275,000	.....	70	5,450,000	.....	70	Appearance highly anemic.
XV.	23	33	F.	"	4,650,000	.....	60	5,100,000	.....	60	
XVI.	24	30	F.	Hysterical torticollis	5,800,000	.....	75	6,750,000	.....	90	
XVII.	25	25	F.	Neurasthenia, dysmenorrhea	3,637,500	.....	55	6,025,000	.....	60	
XVIII.	26	63	M.	Convalescent from epidemic influenza.	4,550,000	.....	70	6,400,000	.....	85	Temp. before, 99 $\frac{1}{2}$ ° F. after, 99 $\frac{1}{10}$ ° F.
											massage 70 minutes.
XIX.	27	18	F.	Hysteria, general symptoms	4,150,000	.....	90	3,300,000	.....	100	Had walked to railroad station and travelled ten miles to town immediately before count.

1 Hemoglobin was estimated by Gowers' instrument.

XX.	28	40	F.	Severe anemia, January 11, 1894 . January 13, 1894 .	1,650,000 1,500,000	1,250	18	1,650,000 5,400,000	12,388	30 35	Before all treatment. Blood showed, poikilocytosis, megaloblasts, microcytes, and on staining, nucleated red corpuscles. Menstruation on January 14th.
	29	..	..	Jan. 24th, after one week's massage daily.	3,800,000	.....	35	.....	.....	.....
	30	..	..	Jan. 31st, no massage for four days, no medicine.	5,550,000	.....	50	.....	.....	.....
	31	..	..	Feb. 1st, five days without treatment	5,900,000	.....	60	.....	.....	.....
	32	..	..	March 31st	4,800,000	.....	50	.....	.....	.....
	33	..	..	Severe anemia, 8 years' duration : Doubtful posterior sclerosis and high-grade anemia.	1,350,000	.....	85	1,500,000	.....	90	The increase at this time was so great from day to day that no further counts were made. Patient was operated for hemorrhoids, losing some blood. No treatment for 12 days after. Counted on fifteenth day from operation.
XXI.	34	..	F.	August 1, 1893	581,000	.....	.....	.....	.....	.....
XXII.	35	50	F.	September 1, "	950,000	.....	.....	.....	.....	.....
				October 18, "	1,028,000	.....	.....	.....	.....	.....
				January 16, 1894	934,664	.....	15	.....	.....	.....	Duodenal ulcer was suspected from pain and other symptoms; no bleeding.
	36	..	..	January 18, "	925,000	.....	12	940,000	.....	12	Poikilo-, micro-, and megalocytosis. On account of the suspicion of ulcer massage of the abdo-
	37	..	..	January 25, "	987,500	.....	22	1,450,000	.....	27	men was omitted. See also Obs. 62.
XXIII.	38	..	..	Pernicious anemia or anemia from atrophy of gastric mucous mem-	.....	.....	.....	.....	.....	.....
	39	64	F.	brane. December 1st	2,250,000	.....	56	.....	.....	.....	Emaciated and cachectic; too feeble for full mas-
	40	..	..	" 28th	2,600,000	.....	.....	4,066,666	.....	.....	sage; rubbed thirty to thirty-five minutes.
	41	..	..	" 29th	2,225,000	.....	.....	2,775,000	.....	.....	No white blood-corpuscles could be found.
	42	..	..	" 30th	2,600,000	.....	.....	3,200,000	.....	.....	Patient died Dec. 31; no autopsy obtainable.
XXIV.	43	52	M.	Toxic anemia, chron. lead-poisoning	3,725,000	.....	30	.....	.....	.....	Counted by different observers on three succes-
	44	..	..	" . . . . .	3,000,000	.....	30	.....	.....	.....	sive days at same hour.
	45	..	..	" . . . . .	4,000,000	.....	30	4,500,000	.....	30	Abdominal massage for twenty-five minutes.
	46	..	..	" . . . . .	4,000,000	.....	30	6,500,000	.....	30	General massage one hour
XXV.	47	26	M.	Toxic anemia, chronic lead-poison-	5,100,000	.....	100	5,925,000	.....	100	Enleureage (forty minutes) was the only form of massage used.
				ing. January 23, 1894, 3 P.M.	4,700,000	78,333	70	7,100,000	184,210	70	White blood-corpuscles 1 : 60 before. " " 1 : 38 after.
XXVI.	48	40	F.	Malarial poisoning, choreic spasm of facial muscles.	6,600,900	.....	80	7,050,000	.....	80	At an interval of one hour after massage.
XXVII.	49	60	M.	Malarial poisoning, chronic gastritis	5,975,000	12,500	65	6,550,000	12,500	80	At interval of ten minutes after massage.
(V.)	50	56	F.	Hemiplegia; January 12, 1894 .	4,350,000	.....	65	5,250,000	.....	70	One hour and ten minutes after massage.
	51	..	..	January 18, " . . . . .	.....	.....	.....	8,912,000	.....	70	One hour's massage; first examination fifteen minutes after massage.
	52	..	..	" . . . . .	5,002,500	12,500	65	8,240,500	75,000	70	One hour and fifteen minutes after massage.
	53	..	..	January 23, 1894, 3 P.M. . . . .	.....	.....	.....	7,297,500	25,000	78	Immediately after one hour's massage.
	54	..	..	" 30, " 3 P.M.	5,750,000	.....	67	7,975,000	.....	70	One-half hour after.
	55	..	..	" . . . . .	.....	.....	.....	8,845,000	.....	70	Three hours and fifteen minutes after massage,
	56	..	..	" . . . . .	.....	.....	.....	6,875,000	.....	70	i. e., 8 P.M.; supper at 6 o'clock.
	57	..	..	" . . . . .	.....	.....	.....	8,062,500	.....	70	Dinner one hour before treatment.
XXVIII.	58	..	..	Neurasthenia following dysentery, January 20th.	5,612,500	.....	69	8,062,500	.....	68	Half-hour after massage. One and one-half hours after massage.

Case.	Observation	Age.	Sex.	Disease.	Before massage.			After massage.			Remarks.
					R. B. C.	W. B. C.	H.	R. B. C.	W. B. C.	H.	
XXIX.	59	...	M.	Malarial fever for three months, tertian; January 1st, January 2d.	2,988,000	4,500	42	.....	.....	.....	No organisms in blood at time of count; aortic insufficiency. Had had previous attack Oct., 1893, of double tertian; counted one hour after massage. Many crescentic and ovoid organisms seen.
XXX.	60	19	M.	Malarial fever, paroxysm 22 hours Jan. 4th, temp. 105° F. Jan. 5th, Quinine, gr. ix., Jan. 5th and 6th, temp 101.5° Jan. 6.	3,004,000 3,456,000	5,000 4,000	42 59	3,104,000 3,680,000	7,500 6,000	45 61	
					3,232,000	3,500	60	3,302,000	4,500	60	

ADMINISTRATION OF IRON.

Case.	Observation	Age.	Sex.	Disease.	Before administration of iron.			After administration of iron.			Remarks.
					R. B. C.	W. B. C.	H.	R. B. C.	W. B. C.	H.	
XXXI.	61	38	F.	Fat, anemic, slight chronic gastritis	4,950,000	83	6,800,000	85	Fat; mucous membranes very pallid; gr. 5 iron pyrophosphate every two hours; took gr. 120 in four days, and 111 10 t. d. tr. ferr chlorid. Patient gained greatly since last count; appearance much improved. Pyrophosphate gr. 95 in two days Pyrophosphate gr. 60 in thirty-six hours; appearance highly anemic. Pyrophosphate gr. 90 in two and a half days; Pyrophosphate gr. 90 in two and a half days; In 48 hours took pyrophosphate gr. 60 and pil. Bland, gr. 36; appearance highly anemic.
(XXII.)	62	50	F.	See Obs. 35-38	3,200,000	.....	60	4,160,000	.....	70
XXXII.	63	20	F.	Epilepsy, minor	4,300,000	.....	50	4,600,000	.....	50
XXXIII.	64	28	F.	" major	4,300,000	.....	65	4,850,000	.....	70
XXXIV.	65	24	F.	Neurasthenia, dysmenorrhoea.	5,225,000	.....	85	7,000,000	.....	90

USE OF FARADISM.

Case.	Observation	Age.	Sex.	Disease.	Before use of faradism.			After use of faradism.			Remarks.
					R. B. C.	W. B. C.	H.	R. B. C.	W. B. C.	H.	
XXXV.	66	59	M.	Hemiplegia—general senile degenerative changes. Same case	6,215,000	12,500	.....	6,200,000	15,000	.....	Patient very weak. Slowly interrupted faradic current to all the muscles, occupying one hour.
	67	...	...		5,300,000	12,500	75	6,175,000	15,000	75	

Any efficient variety of the several types of manipulation which go under the common name of massage would produce similar if not equally marked results. In some of the cases where I did not personally oversee or direct the massage, half an hour was thought by the attendant a sufficiently prolonged application. The counts of these patients showed such small changes that inquiry was made, and afterward in the same cases a longer rubbing was used, with much more decided increase. If general massage is to be of service, it will be found that a full hour must be given to it.

A large proportion of the cases were examined by myself. The rest were divided among several observers, in order to eliminate as far as might be the element of personal error. I am especially indebted to the assistance of Dr. C. W. Burr and Dr. F. S. Pearce. The kindness of Dr. John H. Musser, Physician to the Presbyterian Hospital, allowed Dr. Pearce to examine a number of patients under Dr. Musser's care in that institution, including one in whom "pernicious anæmia" would seem a permissible diagnosis, and another (Case XXII.) which might, if judged by the blood, have been similarly classed, although there were also present severe spinal (ataxic) and hysterical symptoms, reversed and contracted color-fields, hemi-anæsthesia, etc. Several cases were counted at various times by all three of us, and Case XX. had the advantage of an examination by Dr. Frederick P. Henry, whose great experience in the study of the blood makes his confirmation of the results very valuable. I am indebted for the notes of the cases of malarial fever (Cases XXIX. and XXX.) to the politeness of Dr. John S. Billings, Jr., Resident Physician of the Johns Hopkins Hospital.

The instruments used were the Thoma-Zeiss hæmocytometer and Fleischl's hæmoglobinometer in all cases except two or three of my own, where the counts were made with the Malassez "compte-globule;" the estimates made side by side with the Malassez and Zeiss instruments were generally in remarkably close accord.

The preceding tables explain themselves for the most part. In the first columns the "cases" and "observations" are numbered separately for convenience of reference, the age and sex are given, and a brief diagnosis; then follow the state of the red and white corpuscles and the hæmoglobin value before massage, and in the same order in the last three columns are presented the results of examination following massage. The manipulation was, except where otherwise noted, a full hour of thorough, deep general massage.

Perhaps one of the most striking results of an examination of the above figures is the large number of cases in which the count before massage far exceeded the ordinary normal standard of the text-books in the number of corpuscles in a cubic millimetre. Apparently a good many of the cases had some degree of plethora. Seventeen persons

presented more than five and a half million of corpuscles, and of this number six had more than six and a half million. Yet, except two perfectly healthy individuals, there was scarcely one of these who would not have been at once described as "anæmic" if judged by the external appearance alone. It is, of course, to be said that some of them, like Cases VIII., IX., and X., were under full feeding and receiving every possible tonic treatment; still, one would not ordinarily suspect a patient with anterior poliomyelitis of long standing of having over six million corpuscles and over 110 per cent. of hæmoglobin, especially one many weeks in a hospital. Still less would it generally be thought that a hospital resident physician would have such an excess of corpuscles and hæmoglobin as obtained in Case I.; the effect of a year or two's living in a hospital usually is to blanch them effectually. But all of these cases were examined more than once, and in all of them the excessive number of corpuscles was verified by the results of more than one observer. Cases VIII. and X. were both examined by Dr. Burr and by me at different times, with counts practically the same.

The next most striking fact is that, while a very large increase of corpuscles was the rule, there was in only about half the cases a decided addition to the amount of hæmoglobin after massage. In this respect the results differed very decidedly from those of Winternitz, who found an average increase of about 15 per cent. in the hæmoglobin scale after his hydrotherapeutic applications. Twenty showed an increase of 5 per cent. or over. A less difference than this cannot be accurately read on Fleischl's instrument, and although changes of less amount are noted in the table, they are for that reason not included in this summary. The discussion of these facts may be postponed for the present.

First, in examining the reason for this increase in the corpuscles, must be considered whether it is only a matter of alteration in the superficial circulation. It is hardly possible to dogmatically say it is not, since it cannot be proved, although some facts point very strongly that way. The superficial vessels are dilated by the stimulation of their muscles and nerves through massage, but the deeper ones are affected too, the alternate squeezing and relaxation by the hand-grasp acting like the heart-contraction to empty them and to encourage their rapid refilling. Nor would the supposition that the surface blood-currents are hastened serve to account for the steady, continuous, and well-maintained improvement which is had in anæmia by the use of massage, nor to explain the large increase resulting from rubbing the abdomen alone, as in Case XXIV. (Obs. 45). Of course, it may be attributed in part to the indirect effect upon the quantity of blood in the peripheral channels from the accelerated movement of the large amount of that fluid in the abdominal vessels. Yet, even if in anæmia the circulation in the peripheral vessels is insufficient, as the coldness of the extremities and

the general surface pallor show, how does it come that the relative proportion of corpuscles in a given quantity of blood can be altered by massage? If it be said that it is a sufficient explanation of the improvement which results from massage, that the increase is due to the fact that before manipulation the quantity of blood in these vessels was less than it should be and that more was brought into them by the treatment, the increase of the number of corpuscles in a cubic millimetre would still be left unaccounted for. There would be more blood in the vessels—but would there be more cells in a given quantity of it? Somehow, globules must have been called into circulation which were not previously in active movement through the body. If cells thus out of service can be induced to go upon their way through the vessels it certainly follows that an anæmia like that of Case XXVIII., and many others, is not, in the ordinary sense of the word, an anæmia at all. In Case XXVIII. before massage there were 4,500,000 corpuscles and 70 per cent. of hæmoglobin; after massage, 6,400,000 corpuscles and 85 per cent. of hæmoglobin. Corpuscles could not have been manufactured in that time to meet the demand created by an increased superficial circulation; they must have been in reserve for emergencies, or lingering, as I said in my "Preliminary Note," in the byways of the circulation, and what appeared to be an anæmia was really but a lack of activity in the corpuscles or in the circulating fluid generally. Some such explanation as that all the globules were not in use will answer for such an instance, where both the corpuscular elements and the hæmoglobin were greatly increased by massage. But the same explanation will not do for the much larger number of examples where there was a decided increase in the number of corpuscles, without like addition to the percentage of hæmoglobin. An hour's massage can scarcely cause increased production, though after repeated treatment the making of blood-cells may be stimulated; but the effect upon metabolic processes of increased activity and movement of the cells must, for the time at least, be much the same as though their number were actually as much greater as it seems to be.

Where the corpuscles are increased and the hæmoglobin remains as before, it is difficult to account for the lack of change in the amount of this substance. It may be that at any time there are a number of corpuscles carrying but little hæmoglobin, and that these are brought into action by the mechanical stimulation and general increase of the circulation. But before this happened where were they? The condition cannot be wholly due to disease, since it is present in healthy men (see Obs. 1 and 2). Did it arise only from adding to the number of red globules in the peripheral vessels at the expense of the rest of the circulation, the increase of hæmoglobin would be directly proportional to the increase of globules, but this is rarely the case. In Case I., 10 per cent.

represented the increased hæmoglobin value, but the corpuscular addition was almost 50 per cent. of the original amount, and nowhere have we seen the hæmoglobin rise more than 15 per cent. One conclusion must be that even in health there are vast numbers of corpuscles available for use if called for. The deductions from this fact as to diseased conditions will be spoken of later.

As was also said in the "Preliminary Note" in the *Medical News*, it is not difficult to imagine some such explanation as possible when one recalls the appearance of the bloodvessels in living tissues under the microscope. "In the lesser capillaries there appears every now and then to be a clogging, and for a time the corpuscles scarcely move. When this state is overcome in one place, a like condition is evident in another little vessel. Even in the larger channels many corpuscles seem not to share in the general movement, and to be temporarily out of the current. The white ones especially cling along the walls, and some of the red ones progress less rapidly than others, or linger for an instant, as if they were in an eddy or a side current. A portion of the blood, therefore—and, when the whole capillary system is taken into account, it must be a large portion—is not at all times in active circulation."

What we can see under the microscope is what takes place in the tiniest branches of the extreme peripheral circulation. We can scarcely suppose that in the larger channels the same phenomenon is going on upon a more extended scale, for there the stronger movement of the current would forbid it.

Hayem has said that the improvement which we desire to make in anæmia is an increase in the *active and circulating* amount of hæmoglobin. Apparently this is exactly what we do get a small degree of by this method.

Another thing very desirable to know is whether the corpuscles thus introduced into circulation are in all respects similar to the ones normally found moving in the vessels. It has seemed to me in most of the cases that there has been no decided difference between the microscopic appearance of the corpuscles before and after massage. In a few instances, and more notably in those cases which were suffering from very high grades of anæmia, like Cases XX. and XXI., it appeared to me that the number of blood plaques was greater after massage; but the former case was one in which every symptom pointed to pernicious anæmia, and, while this diagnosis is very far as yet from being borne out by the result, yet the microscopic changes in the blood were all such as we are accustomed to find in cases of advanced progressive anæmia. There were numerous corpuscles very much increased in size; there were nucleated red corpuscles; there was poikilocytosis, and in several slides, Dr. F. P. Henry, who saw this patient in consultation with me, found upon staining a few nucleated red corpuscles. The white cor-

puscles were enormously increased; before massage they were only 1:1200, but after massage this proportion was very greatly altered, becoming 1:134. This also was one of the cases in which a great difference in the hæmoglobin percentage was effected. The Fleischl instrument before massage gave us between 15 and 18 per cent., and after massage over 30 per cent. My friend Dr. Judson Daland, who upon another occasion examined this patient,¹ tells me that the readings of the Fleischl hæmoglobinometer below 20 are much too low, and he has suggested a very ingenious plan for overcoming this difficulty. This same case is perhaps the one which shows most valuably the amazing effects of massage alone. The count, as will be seen from the table (Obs. 28-32), was, upon the 11th and 12th of January, 1,500,000 red corpuscles and 15 to 18 per cent. of hæmoglobin, while upon the 24th of January, the patient having in the interval had no other treatment than massage and rest in bed, without any excessive feeding, the count was 3,800,000 before and 5400,000 after manipulation. It is noticeable that in this examination the hæmoglobin was the same both before and after treatment—between 30 and 35 per cent.—and was not materially increased over the percentage upon the previous occasion, when the count had been very much lower. All treatment having been stopped from the 24th of January, the patient receiving neither medicinal nor mechanical treatment of any kind, the corpuscles nevertheless went on increasing until, on January 31st, they had reached the amazing figure of 5,550,000, with 50 per cent. of hæmoglobin. This examination was made by Dr. Burr, and the next day, February 1st, I made an estimate myself, with the result of finding 5,900,000 corpuscles and 60 per cent. of hæmoglobin.

It will be seen from the column headed "Diseases" in the table, where a brief statement of the patient's condition is given, that almost every form of anæmia and malnutrition is included, and that in all but three of the observations there was an increase in the number of corpuscles, varying from a very slight addition to over three and a half million. Nor does the increase seem to depend at all on the form of disease from which the patient was suffering. In the several healthy cases the increase was great, although the persons examined appeared to be already in a condition approaching plethora, judged by the counts alone. This was an entirely unexpected result. In slighter anæmias the improvement was very marked (Cases XIV. and XV.). In malarial anæmia, of which two decided cases are in the table (Cases XII. and XXVI.), there were like changes. In forms due to malnutrition

¹ Dr. Daland made a single estimate with the hæmatokrit, giving as a result 2,500,000 red cells. The white cells could not be properly rated owing to the presence of large numbers of microcytes, which altered the white column unduly. At the same time I made observation No. 30, which, if accurate, would show a much larger number of red globules.

(Cases XVI., XXXI., XXXII., and XXXIII.); in severe simple anæmia (Case XXI.); in senile degenerative changes (Cases V. and VII.); in the case of extreme anæmia from atrophy of the gastric mucous membrane (Case XXIII.), and in the cases of metallic poisoning, which were of the most chronic description (Cases XXIV. and XXV.), varying degrees of increase resulted.

It was not always possible to make several successive examinations at short intervals of the same patient, as the time over which this would have spread the examinations would have introduced other factors, such as an unusually prolonged abstinence from food on the part of the patient; but, in some of the cases that were counted at intervals after rubbing, the increase was found in one hour or more to be greater than in a few minutes after the completion of manipulation (Obs. 53-58).

Hæmoglobin is occasionally increased by massage, but by no means uniformly; it appears to be rather the exception than the rule to find large addition to the percentage of coloring matter. It occurred in twenty cases (omitting increases of less than 5 per cent., which are untrustworthy); but in one or two of the more severe cases (Cases XVI., XVIII., XX., and XXII.) it was very marked. The source of supply of hæmoglobin for the red corpuscles is a matter still in doubt. Judging from the frequency with which a great reduction of hæmoglobin is seen in anæmias, while the corpuscular count remains near the normal (chlorotic type), the cells in all cases of poverty of blood vary less than the hæmoglobin; they may be inaccessible to our observation; they may themselves be affected by this reduction in their hæmoglobin value, so as to make them less active, and again it may be that the hæmoglobin-production cannot be so rapidly or readily increased as the manufacture of corpuscles.

With the exception of the one patient who died during the study of the blood, by far the worst case, judged by appearance, general symptoms, length of continuance of the disease, and by blood examination, was Case XX. By an accident she was given iron for a few days, which may somewhat have interfered with the result; but other than this she had no more treatment than rest in bed, without excessive feeding, and very thorough-going daily massage; yet, with this, as I have said before, the hæmoglobin and corpuscular elements both increased with amazing rapidity and continued to increase even when all treatment was stopped, a result which sufficiently does away with any idea that the improvement in these cases is due to a temporary effect upon the superficial circulation. Here again was to be seen a disproportionate improvement in hæmoglobin and corpuscles, for when the corpuscles had reached nearly six millions, the hæmoglobin had only attained to 60 per cent.

No doubt there is another factor in these causes of improvement: the

better tone of the muscles, of the heart, and of the general circulation, which is so quickly shown in such patients. Case XX. had mitral valvular disease and a consequent murmur, as well as a very loud and clear hæmic murmur, and suffered from a general deficiency of the circulation, manifesting itself in a tendency to chilliness and coldness of the extremities. The very first hour's massage left her warm and comfortable, and its effect was felt for several hours and continued from day to day to last during a longer period each time. The organic murmur was little changed, but the hæmic murmur, which, if altered at all during the first week, was somewhat louder, has constantly lessened in intensity till now it is a very faint, soft bruit.

A few words must be said about the results of the administration of iron in large doses during a very short time. The experiments (five) were too few to be conclusive, but in all there was marked increase of the corpuscles, although the hæmoglobin made no perceptible gain. The pyrophosphate was used because of its solubility and unirritating quality. The ease with which such large quantities of iron were borne by patients with the irritable digestion of anæmia was remarkable. Probably, had the drug been longer continued the hæmoglobin would have shown more effect of it. But this and other questions relative to the effects of medicine upon the cellular production must be reserved for further study. In one case (Case XXXV.), an unfavorable subject, a trial was made of the effect of slow faradic interruptions applied to the muscles, but the result is uncertain and the case is only added for its evidence of another means of tonic treatment.

To sum up, first, the *certain results*: In health, massage increases the number of red corpuscles, and to a less degree and not so constantly their hæmoglobin value.

In all forms and grades of anæmia there is a very constant large increase in the number of red corpuscles after massage; this is greatest at an interval of about an hour, after which it slowly decreases. This decrease is postponed more and more if the manipulation be daily repeated. An improvement also takes place in the general tone of the circulatory and muscular systems.

There is an occasional but inconstant increase in the hæmoglobin value, and this increase is proportionately less great than that of the cellular elements.

It has been doubted if so powerful and fatiguing a method of treatment as massage is safe or desirable in very high grade anæmias. It is now for the first time made clear that it is of great and certain service and without danger in such cases, no matter how feeble.

It is evident, too, that our present definitions of anæmia are insufficient. An essential part of the description in all of them is that there are defects of number, of color, or of both in the blood. This is not

necessarily or always true. The fault may lie in a lack of activity or of availability in the corpuscles. The state of things in the system may be, to draw an analogy from economic conditions, like the want of circulating money during times of panic, when gold is hoarded and not made use of, and interference with commerce and manufactures results.

Lastly, neither an anæmic appearance nor a blood count is alone enough for a certain diagnosis. Other signs must be used as a check on

normal corpuscle-count, with a good percentage of hæmoglobin. Yet they presented every external sign of poverty of blood: pallor of skin and, more important still, of mucous membranes, cold extremities, anorexia, indigestion, dyspnœa on trifling exertion. In such cases we must suppose either that the total volume of the blood is reduced, or that the usefulness of the corpuscles is in some way impaired, or that both these troubles exist together.

The white corpuscles have not received sufficient attention in this study, although it seems as if in most cases they were increased as well as the reds.

Next, as to *general conclusions*: It is possible that even in health there may be a certain varying percentage of corpuscles out of the moving current of the blood. If so, where are they, and what are they doing? We know by direct observation that all corpuscles do not travel with the same rapidity, that some loiter and delay. Our studies prove clearly enough that a great number of cells may be brought rapidly into the circulation by massage, and it seems at least probable, as Dr. Pearce has suggested to me, that those thus thrown into the current have less hæmoglobin value than the ones already in movement. This is a possible inference from the fact that corpuscular increase does not imply an addition of hæmoglobin, or at least not a proportionate addition. Have some of the globules thus cast into the hurrying stream of the blood been delaying to take up or unload their freights of coloring matter or oxygen? Do corpuscles in states of disease behave differently toward hæmoglobin, so that they absorb it less well, or transport it less successfully, or give it up with abnormal readiness? Some forms of anæmia may be due to an increased delay on the part of such cells as these, lingering sluggishly about their business, and only pushed and forced into greater activity and usefulness by the direct stimulus of massage. Whether these globules are immature ones or ones that have been made use of to the extent of their capacity also remains to be discovered.

Even when direct anæmia has been caused by hemorrhage, a part of the result may be due to the inactivity of a certain number of the corpuscles, and we may find in massage a valuable aid in the treatment of such cases, both by the impetus it will give to cells indisposed or dis-

abled for free movement, and by stimulation of the making of corpuscles. I hope soon to publish some facts as to the application of manipulation to such disorders.

The excess in amount of blood brought into the circulation by massage may be one of the reasons why in occasional sensitive patients we see such discomforts as headaches follow its use. Practically, we have added a certain number of millions of cells to their tissues, and need not be astonished if some signs of plethora result.

It is evident that massage has complex effects and that the numerical increase of the corpuscles, the added hæmoglobin value, and the better circulatory and muscular tone, may be due to many causes operating together—a vasomotor nerve stimulation, a direct hastening of the venous currents, an indirect hastening of arterial flow, an improved metabolism, are only some of them.

MYXŒDEMA, ACQUIRED AND CONGENITAL, AND THE USE OF THE THYROID EXTRACT.¹

BY GEORGE W. CRARY, M.D.,
OF NEW YORK.

BUT little new light has been thrown upon the morbid anatomy of this disease since the publication of two autopsies by Hun and Prudden, and of the report of the London Clinical Society,³ in 1888, and I shall use largely their conclusions here in describing the post-mortem changes found in adults.

The Thyroid Gland: This is constantly the seat of disease. Usually much diminished in size, with excessive atrophy of its parenchyma and an increased amount of connective tissue. These changes are progressive and in some cases there is left little or no true gland substance. Hun and Prudden also found "new formation of lymphatic tissue in the thyroid."

The Skin: Separation of superficial layers of the corium. Atrophy of hair follicles (Hun and Prudden). Obliteration of lumen of sweat-glands and of sebaceous glands.

The Arteries: Obliterating endarteritis with atheromatous degeneration, and in places amyloid degeneration.

The Heart: Hypertrophy of left ventricle (Hun and Prudden). Interstitial myocarditis (Clin. Soc.).

¹ Read before the New York Academy of Medicine at its regular stated meeting of November 16, 1893.

² AMERICAN JOURNAL OF THE MEDICAL SCIENCES, July and August, 1893.

³ Report of London Clin. Soc., 1888, Committee on Myxœdema.

The Nervous System: Chronic diffuse neuritis only.¹

The Kidneys: Chronic nephritis.

Interstitial changes occur also in the liver, the submaxillary gland, and in the adrenals.

The Blood: Diminished number of red corpuscles. White, normal. Diminished percentage of hæmoglobin.

The presence of mucin in increased quantities in the skin and other tissues does not seem to be constant in myxœdema, but would seem to be a marked feature in the strumipriva of lower animals.²

As to the pathology in the congenital variety, I have seen no report of autopsies performed. Hofmeister³ removed in young rabbits the thyroid gland, but left the glandules of Gley, thereby leaving enough gland tissue to maintain life, and found that the hair became coarse, the body became short and thick, the growth of the skeleton was arrested, the epithelium of the convoluted tubules of the kidneys was altered, and enlargement of the hypophysis cerebri occurred.

Myxœdema is a disease of all ages, occurring at any time from the period of intra-uterine life to old age, but most commonly making its appearance, in infants, shortly after birth; in adults, in women near the time of the menopause. In the acquired form in adults, the clinical pictures presented when the disease has reached full development, show but few variations. In these cases the appearance is striking and characteristic. The facial expression is dull, heavy, and mask-like, and the natural lines are obliterated. The face is large and especially broad at the lower part; the skin is dry, sometimes smooth, cold, and waxy, sometimes wrinkled and scaly, but always thickened. The eyelids are swollen, sometimes to such an extent as to nearly close the eyes, and the constant effort to elevate the upper lids produces a characteristic arch of the eyebrows. The nose is swollen and the bridge is flattened. The lips are large and thick and protrude, the lower one being pendulous, and they are of a bluish or violet hue. The tongue is large and thick, and can be moved about but slowly and with difficulty. The fauces are swollen and the mucous membranes pale. There are quite constantly spots of hectic over the malar bones, which are in marked contrast to the color of the rest of the face, and there are often seen upon the sides of the face patches of cloasmata. Occasionally the whole face, and also the hands, will be of a yellowish tinge, and more rarely are stained a dark mahogany, simulating Addison's disease. The hair upon the head is thin and coarse, and the scalp dry and scaly. The whole body is swollen with an œdema, which does not pit upon pressure, although occasionally there

¹ AMERICAN JOURNAL OF THE MEDICAL SCIENCES, July and August, 1888. Greenfield: Edinburgh Med. Journ., May, 1893, p. 1048.

² Horsley: British Med. Journ., Jan. 17 and 31, 1885.

³ Putnam: Trans. Assoc. Amer. Phys. 1893, viii. p. 343; AMER. JOURN. OF THE MED. SCIENCES, Oct. 1893.

will be associated with this condition, usually most marked in legs and feet, the ordinary œdema, which will pit. Hun and Prudden explain the non-pitting nature of the œdema in this disease by the fact that it is largely confined to the superficial layers of the corium, where the spaces are so small and the interlacement of the fibres so fine, that the fluid is not easily driven away by pressure. The skin is everywhere waxy, dry, and with more or less desquamation, sometimes in large flakes. A total absence of perspiration is the usual condition, although occasionally the body, and especially the neck and shoulders, will become temporarily covered with a clammy moisture. In my first case,¹ phenacetine and hot mustard foot-baths caused no sweating, and sinapisms no redness. There is little or no hair in the axillæ or upon the pubes. The nails and teeth are imperfect. The gums are spongy. The swelling is most marked in the clavicular regions, and often there exist here, and in the lower abdominal region, fatty tumors, which are not usually sharply circumscribed. The whole abdomen is large and pendulous. The swelling of the skin over the breasts often entirely hides the nipples. The swelling of the hands and fingers, and the dryness and inflexibility of the skin, cause great inconvenience to the patients. There is nearly always present dysphagia, and this is often so great that even liquid food can be swallowed only slowly and with difficulty, and solid food will be regurgitated. The swelling of the nasal mucous membrane makes it difficult or impossible to breathe through the nose, and there is loud snoring during sleep, and "blowing the nose" is accomplished in an unsatisfactory manner. The breathing is usually slow, and if for any reason is quickened, dyspnœa results. These attacks of dyspnœa are often a strongly marked feature. The speech is slow and monotonous, and is almost pathognomonic in its peculiarity.

The cutaneous sensibility to cold is great, and these patients are invariably worse during cold weather. There are usually subjective sensations, as of cold water being poured down the back or dropped upon the face or body. Deafness is usually present, and sometimes is marked. Smell and taste are sometimes impaired. There is paresis of all the muscles, and this is often so marked that the patient is scarcely able to stand without support, to lift anything with the hands, or to keep the head from sinking forward on to the chest. The movements of these patients are clumsy, and the walk is waddling. Bramwell² aptly describes them as "hippopotamus-like." Hemorrhages from mucous membranes are nearly always present, usually in attacks of varying severity, and at night they are prone to stain the pillow with a brownish fluid which comes from the mouth or nose. Rheumatoid pains are often complained of, especially in the wrists, ankles, and back, and there is often

¹ Med. Record, June 17, 1893.

² Edinburgh Med. Journ., xxxviii. p. 955.

pain and tenderness on pressure along the sterno-mastoid muscle on one or both sides. Headaches are generally complained of; anaphrodisia is common, and intercourse is usually painful in women. The temperature is low, ranging between 95° and 97.5°. Pulse usually about 70, and small; respirations between 17 and 18; heart-sounds feeble and muffled. Urine always of low specific gravity, between 1008 and 1014; usually acid, and containing a diminished amount of urea; albumin in small amount is generally found, and, as a rule, there are hyaline and granular casts. Irritability of the bladder, with frequent micturition, exists. The bowels are costive, the appetite is poor, and no special kind of food is craved. The mental condition presented by these cases is varied. There is present a condition resembling mild dementia, with lack of interest, listlessness, mental weakness, melancholia, and hallucinations. Dr. Starr,¹ who has fully described the mental state present in these cases, further states that "It is thus evident that both the afferent channels of communication from the external world and the efferent paths of impulse to the muscles were in some way blocked by the disease, while the internal processes of mental association and activity were also hampered and deflected from their ordinary course."

These features are usually all of gradual development, the disease running a very chronic course from the appearance of the first symptom, which may be the lassitude and indisposition to exertion, the paresis, or the swelling. The onset may, however, be sudden, but more commonly is very gradual. The course of the disease is chronic, lasting from the appearance of the first symptom until the death of the patient many years afterward. There are occasional periods of amelioration of many of the symptoms, and these patients are always benefited by warm weather. Bramwell states that the disease tends to inhibit childbearing, and that pregnancy induces more rapid development of the symptoms; but the case reported by Kirk,² in which the disease began at twenty, and the patient subsequently marrying, bore eight children, her condition being much improved during the periods of pregnancy, would show that this statement has exceptions.

When death occurs without complicating disease, a fall of temperature with coma usually precedes the end. The similarity of the mode of death to that due to uræmic poisoning suggests that the degeneration of the kidneys is the principal factor in causing a fatal termination.

In infants the disease presents special features by which it has been separated from myxœdema, and classed as a disease by itself, namely, cretinism. When occurring outside of those places where goitre and cretinism are endemic or even epidemic, and probably due to local causes, the term sporadic cretinism is used. This condition was sup-

¹ Trans. Amer. Phys., 1893. New York Med. Record, June 10, 1893.

² Lancet, September 23, 1893; Case iv.

posed to be intimately associated with myxœdema as early as 1873, when the first clinical study of the disease by Gull was published; and, since the report of the London Clinical Society in 1883, this connection has been fully appreciated. Osler¹ points out the necessity of limiting the term cretinism strictly to those cases due to loss of function of thyroid gland, whether this loss be due to congenital or progressive atrophy or even coarse changes. The special features referred to above are due to the arrest or retardation of growth and development, both mental and physical, which takes place in the congenital myxœdemic, from the time when the diseased condition of the thyroid has reached the degree necessary to affect the body nutrition. This may occur at varying periods of intra-uterine life, so that at the time of birth there may be the supra-clavicular fatty tumors, the thick redundant skin, the swelling of the hands and feet, the short extremities with the large, soft epiphyses and ossified apophyses, and the broad skull with wide-open sutures—making the diagnosis plain. These children usually die very soon after birth. In other cases the child is normal in appearance at birth, or there may exist a goitre, but at any time from then until it is five years old (Osler), the myxœdematous symptoms may begin to appear. I am inclined to believe that in most cases the evidences of sporadic cretinism begin to appear early, but that being at first of the nature of simple arrest of development, they do not for some time cause comment. The myxœdematous symptoms develop gradually, but at an early period in the life of the child the appearance has become characteristic. During the natural period of growth the changes become exaggerated, and an adult congenital myxœdemic, between twenty and thirty years of age, “is a being degenerate both physically and intellectually; short in stature and childish in appearance” (Osler). The height is usually about three and a half feet. There is marked lordosis, with large protruding abdomen, and the head is carried well forward between the shoulders. The epiphyses of the long bones are large, the arms and legs are short for the body, and there is genu varum, and with this is often associated a condition of genu valgum. The hands and feet are large and puffy, and the fingers broad and clumsy; the skin of the body is thickened and waxy, often dry and scaly, and seems too large for the body. The hair is often thick on the scalp, sometimes present on the face, but is thin or wanting in the axillæ and on the pubes. Supra-clavicular swellings, and often fatty growths, in these and other regions are present. The facial expression is usually dull and stupid, but these little people are easily pleased, and their expression at such times is a smiling one. The eyes are more or less closed by the swelling of the lids and are widely separated. The nose is retroussé, with broad flat

¹ Trans. Assoc. Amer. Phys., 1893. AMER. JOURN. MED. SCI., Nov. 1893.

bridge and wide prominent nostrils. The tongue is large and thick, and in most cases protudes constantly from the mouth. The lips are thick and prominent, the mouth is large and usually open. The skull is brachycephalic and broad. Asymmetry of the body and head is commonly present. The muscles are weak. The mental condition varies from complete idiocy to a condition of simply feeble intelligence. In the more marked cases deaf-mutism is also present. The memory seems as a rule to be good. Epileptiform convulsions are not rare. That there are many grades of cretinism as regards the mental condition is well recognized, but that there are also degrees as regards the physical development has not been strongly enough brought out. The use of the term congenital myxœdema for cretinism, gives us a wider range of classification; and the diagnosis is to be made not alone upon the dwarfed stature and the mental deficiency, but also and principally upon the condition of the skin and connective tissue (Horsley); or, in other words, upon those same evidences upon which we make the diagnosis of the acquired form of the same disease in adults.

These children learn to walk and talk, if at all, quite late in life, and their gait is a peculiar waddle. Dentition is delayed and slow, the teeth rapidly decaying. They have subnormal temperature and in winter suffer from the cold and are prone to "coughs and colds."

A comparison of the descriptions of acquired myxœdema and cretinism just given show many points of striking similarity, and this likeness would be more marked were it not for the difference in stature.

As to the etiology of myxœdema but little is known. In adults there is usually a history of some severe drain upon the health and strength of the individual, through severe hemorrhage, prolonged and severe vomiting as from sea-sickness, intense and protracted mental worry, frequently recurring pregnancies, etc. In attributing the origin of the disease in any case to a severe hemorrhage the tendency to hemorrhages in these cases, even at an early date, must be borne in mind. In both adults and children the family history is quite apt to show tubercular or neuropathic diatheses in contemporary relatives or ancestors.

The diagnosis of myxœdema in its fully developed condition is not difficult, especially when one has seen even a single case, for the different patients present a remarkable likeness to one another, and the disease has been frequently recognized by intelligent persons, not physicians, from the facial appearance alone. But there is one disease with which the acquired form of myxœdema may be, and many times has been confounded, namely, chronic Bright's disease. In my case previously reported and in the two first cases of acquired myxœdema given below, a diagnosis of chronic nephritis has been made to answer for all the symptoms for many years, and one case of chronic Bright's has been sent to me as a possible case of myxœdema. In the clinical pictures presented

there are many points of similarity, and this is especially true when in myxœdema there are active changes in the kidneys. In both myxœdema and Bright's there is the general swelling, the dyspnœa, the feeble heart, the headaches, the occasional hemorrhages from the mucous membranes, and the general weakness; and an examination of the urine shows the diminished quantity of low specific gravity, containing a small percentage of urea and albumin, with usually hyaline and granular, and sometimes even epithelial casts. The non-pitting nature of the œdema and a careful study of its distribution—for the œdema of Bright's, being affected by gravity as well as by pressure, is found most marked in the dependent portions of the face, body, and extremities, while in myxœdema it is of more general distribution—the dry, rough skin with no sweating, the falling of the hair, the dysphagia, and the subnormal temperature, are some of the most striking features present in myxœdema and do not exist in chronic nephritis. These points, with the manner of speaking and the tone of the voice, will make the differentiation not difficult. While, then, the disease when fully developed presents symptoms which are sufficiently characteristic to be rightly interpreted after an ordinarily careful examination, real difficulty may exist in the early stages of the disease, and a thorough study of all the symptoms presented by the patient be necessary before the diagnosis can be made. The congenital form of the disease in infants in some degree simulates rhachitis, but the mistake in diagnosis is not apt to occur.

TREATMENT.—The treatment of myxœdema by the thyroid gland has come to stay, and to Dr. G. R. Murray, of Newcastle, England, belongs the credit of its first practical application. Associated with his name in this matter must be those of Mackenzie, of London, and Fox, of Plymouth, England, who, with Howitz, first used the treatment by the stomach. A very clear idea of the gradual progress in experimental work which led to Murray's consummation can be obtained by reading the "Historical Summary," in Dr. Kinnicutt's¹ late article, where the names of Ord and Horsley are given justifiable prominence. In administering thyroid gland to persons suffering from myxœdema, we supply to them a "something" of which they are deprived by the functional inactivity of their diseased thyroid, thereby causing to disappear most of the abnormal conditions to which such deprivation gave rise. One of these abnormal conditions, however, does not always disappear, viz., the anæmia. It may or it may not be true that a direct hæmopoietic function belongs to the thyroid, but it is a fact that all the other symptoms of myxœdema may be caused to disappear by the use of thyroid extract, and the anæmia of the disease not only not be benefited,

¹ Trans. Assoc. Amer. Phys., 1893, p. 314. N. Y. Med. Rec., Oct. 7, 1893.

but actually aggravated ;¹ though in some cases, and notably in Murray's monkey,² the red corpuscles and percentage of hæmoglobin are increased. Further experimentation and the use of thyroid extract in simple anæmia will throw more light on this point. The temperature is caused to rise, and the pulse and respiration are increased in frequency by the thyroid administration. That this is due directly to the thyroid gland as such, and not to ptomaine or septic poisoning, was well shown by the bacteriological examination made by Dr. Lambert, and included in my former report, of the very lot of extract which caused such alarming effects in my first case, and by the fact that when this same extract was administered in smaller but gradually increasing doses, no further trouble was caused. The various bad effects of thyroid, noted in reported cases, seem to have been caused by too large dosage. When the hypodermatic method has been used, aside from the occasional abscesses which have been caused at the point of injection, and which are not due to anything thyroid in the preparation, flushing of the face, headaches, indefinite pains, nausea, vertigo, weakness and fainting, are frequently noted, and in two cases³ epileptiform convulsions have been recorded. When given by the stomach, nausea, vomiting, pains, weakness, profuse perspiration, depression, headaches, rapid heart, and "toxic symptoms accompanied by extreme feebleness of heart,"⁴ have been observed.

The action of thyroid extract upon the urine in myxœdema is worthy of special consideration. The amount of urine is increased, the specific gravity is higher, the urea is increased,⁵ and the albumin and casts disappear. All these changes were well shown in my first case already reported. Ord⁶ has pointed out that during the first two or three weeks the nitrogen excreted is in excess of that in the food taken, and that this excretion is mostly as urea. This excretion of nitrogen in excess is well shown by the careful investigations of Vermehren⁷ upon four cases of myxœdema, and this observer also found that the thyroid administration had a similar effect upon the urine in senility, though to a less marked degree; and that in myxœdema a much less percentage of the nitrogen taken in the food was found in the feces, proving the more complete absorption. The observations of Ord, Alexander Napier, and others, bear out the statement which I have already made, that "at the time when the general swelling was being most actively reduced by the extract, the daily amount of urea was increased." This reduction in the body weight is most active during the first two or three weeks of

¹ Putnam: Trans. Assoc. Amer. Phys., 1893, p. 337. AMER. JOURN. MED. SCI., Oct. 1893.
Thompson: Trans. Assoc. Amer. Phys., 1893; N. Y. Med. Rec., 1893, xliv. p. 174.

² Brit. Med. Journ., Sept. 1893, p. 23.

³ Murray: Brit. Med. Journ., 1892, ii. p. 540. Hearn: Ibid., p. 452.

⁴ Lundie: Edin. Med. Journ., May, 1893, xxxviii.

⁵ Alex. Napier: Lancet, Sept. 30, 1893.

⁶ Brit. Med. Journ., July 29, 1893.

⁷ Deutsche medicin. Wochenschr., Oct. 26, 1893.

the treatment, and its rapidity will depend upon the amount of thyroid given. The curative effect of the administration upon the myxœdematous symptoms in the adult are known and constant, as the weekly reports of numerous cases show. Two men have, however, reported failures: Mitchell-Clark,¹ two cases; and W. C. Krause,² of Buffalo, two cases. By mistake, Kinnicutt used a lymphatic gland minced, without any reaction, and Lundie, for a month, used thymus before finding his error, and obtained no other result than elevation of temperature; and I should presume that such mistakes had occurred to others, among whom may possibly be Mitchell-Clark and Krause.

In all the cases under my observation, and in many of the reported cases, the rheumatoid pains in the joints have been aggravated by the treatment; and in two of my cases acute attacks of joint inflammation, with redness, swelling, and severe pain, have occurred, accompanied by a rise of temperature, and these attacks were controlled by anti-rheumatic remedies. With the exception of the anæmia and the rheumatoid pains, the symptoms of acquired myxœdema are regularly caused to disappear by the use of some preparation of the thyroid gland after from three to four months' treatment. Murray³ puts the duration of this, his "first stage" of the treatment, at six weeks, and with the hypodermatic method it is possible that this period may be shorter than when treated by the stomach. During this time the patient must be carefully watched, and unusual exertion and mental excitement, and the administration of depressant drugs, such as pilocarpine,⁴ should be avoided, and especially in cases with cardiac or arterial degeneration, and, indeed, in such cases absolute rest in bed is desirable.⁵ The result of thyroid treatment in congenital cases is summed up by John Thomson⁶ as follows:

1. Growth of skeleton accelerated in infants, and recommenced in older cases.
2. Rapid disappearance of abnormal swelling.
3. Temperature raised.
4. Emaciation and muscular debility during first two or three months.
5. Distinct advance in mental capacity.

After the treatment has resulted in a so-called cure of the disease, much smaller doses will be required to maintain the patient in a condition of health. Cessation of treatment for a few weeks is followed by a gradual reappearance of the symptoms.

The thyroid glands are administered in various ways: when by the hypodermatic method, Murray's original preparation is most frequently used. This consists of a mixture containing one drachm each of expressed juice, glycerin, and a one-half of 1 per cent. watery solution of carbolic acid. Of this from five to fifteen minims are injected two

¹ Brit. Med. Journ., August 27, 1892.

² Med. Rev., Sept. 16, 1893.

³ Lancet, 1893, vol. 1. p. 1130.

⁴ G. Stewart: London Practitioner, July, 1893.

⁵ Brit. Med. Journ., August 27, 1892.

⁶ Brit. Med. Journ., Sept. 23, 1893.

John Thomson: Edin. Med. Journ., May, 1893.

or three times a week. Flushing of the face or pain at the seat of injection, which is preferably the lumbar region, should be taken as an indication to stop the injection. By the stomach, the feeding of minced, raw, or partially cooked glands, the powder, and the glycerin extract of various strengths, have been used with success. I have used the glycerin extract in all cases, and make it of a strength of twenty-four grains of gland to one drachm of glycerin. The glands are carefully cleaned, minced, and after maceration with the glycerin the mixture is allowed to stand for three or four days, after which it is filtered under pressure as required for use. Full asepsis is observed throughout the different steps, and an anhydrous glycerin, previously sterilized, is used. Diseased glands are discarded. The product should be kept away from the heat and light. The ordinary beginning dose of this preparation, for an adult, is five drops three times a day, to be gradually increased to fifteen drops; in infants, one drop three times a day should be given, and sixteen drops a day, in three divided doses, seems to be the limit of increase. From my experience, I believe that the glands of the young animal are productive of more good than those taken from the older sheep, and I now make use only of the glands taken from lambs; using the butcher's guide of ununited epiphysis to determine the approximate age. The cases reported below are significant in showing this difference. The extract thus made will keep for months without deterioration or apparent change.

The histories in the first two cases reported below have been very generously given to me by Dr. Starr, to whom the patients had been sent.

CASE I.—Mrs. B., aged fifty-five years. Since the birth of last child, fourteen years ago, she has been suffering from present disease, and at that time was subjected to much mental worry, caused by the death of two children. Three weeks after this last delivery she was badly frightened. The first symptom which attracted attention was the swelling of the abdomen, and later came metrorrhagia, which was severe enough to cause anæmia. Menopause occurred ten years ago. About seven years after last accouchement, on awakening in the morning, the whole body was swollen, and shortly after this the skin showed irritation and became dry and scaly. She has had twitching of right arm, and at one time para-anæsthesia of right side; no paralysis, no hallucinations. The disease had been gradually progressive until her appearance at Dr. Starr's office on May 13th, at which time I first saw her. At this time the patient presented all the characteristics of a typical myxœdemic, in the swelling, skin, speech, dysphagia, dyspnœa, anidrosis, falling of the hair, the subnormal temperature, dulness of hearing, and hemorrhages from mucous membrane of mouth, and in her mental condition. There were slight hectic spots over malar bones, but no cloasmata, and pain along sterno-mastoid muscles and in the ankles was complained of. The patient was not confined to bed, or house, but was weak. Arch of eyebrows was characteristic. Anæmia was present,

but not marked. This patient was immediately put upon the glycerin extract of thyroid gland of sheep (gr. xxiv-3j), average weight of one lobe 189 gr.; gtt. viii, t. i. d., to be gradually increased. Three days later a change in the voice and in the physical appearance was perfectly apparent, and the patient herself said that her clothes were looser, and that she felt better. No rise in the temperature, either immediate or remote, was induced, and, taken by mouth, was 96.5° on the third day.

June 7. Free perspiration occurred, and the skin was somewhat less rough. She had now reached a dose of gtt. xiii, t. i. d.

12th. The patient was taking gtt. xx, t. i. d. The improvement was slow, but progressive; general swelling much diminished, finger-rings slipping off easily, and there was no dysphagia. Dyspnoea only on exertion.

July 26. Patient had reached gtt. xxiv, t. i. d., and had had no rise of temperature much above 97° , but on this date temperature rose to 100.5° and she suffered severely from rheumatic pains, especially in knees. Salol and phenacetine somewhat diminished pain, which, however, lasted for about a week, and thereafter frequently recurred. Hair continued to fall. Improvement slowly progressive.

August 2. I put the patient upon an extract made from the glands of lambs, of average weight of 20 grains to the lobe, and gtt. x, t. i. d. were given.

September 1. Since the change to the young glands the improvement has been rapid. Swelling diminished much more sensibly; hair ceased falling; exfoliation took place from whole body, and skin was soft and moist, and speech more nearly natural. Physical and mental strength greatly improved. During the following week the patient was without extract, and at the end of that time, though showing no signs of returning disease, was much prostrated. Extract was again begun and pushed rapidly to gtt. xv, t. i. d.

By the middle of September the patient showed a change that was marvellous, and was apparently in a perfectly normal condition, with the exception of the anæmia, with temperature of 98.8° . She was directed to diminish the amount of extract to gtt. xv twice a day, but at the end of two weeks complained that she felt that this was too little, and it was again increased to gtt. xv, t. i. d. This dose has been gradually diminished, and the patient remains well.

CASE II.—Mrs. C. A photograph of this patient taken in 1881 shows a normal face with features clear and sharp, but with some slight fulness of the upper lids. The hair at this time was abundant and nearly white. The menopause occurred in 1883. Early in 1884, during an ocean voyage, this patient was badly frightened and dreadfully sea sick, perspiring most profusely. Later in this year the myxœdematous condition was well marked, the skin being dry and without perspiration, and this was the first symptom noted by the patient. Hands became very dark, almost mahogany-color. She has had slight dysphagia since a girl, but after 1884 this became worse and was distressing. By the end of 1884 the slowness of speech and the swelling of the face, neck, body, and extremities were well advanced. The photograph herewith given was taken in 1887. (Fig. 1.) During the year 1890 she was attacked once with sudden loss of consciousness and fell. In January, 1892, she had pneumonia, which ran a regular course. Dr. Starr saw her first in May, 1891, at which time she was in a condition of chronic hysteria with the

condition of myxœdema well advanced, the eyes being nearly closed. The urine showed sp. gr. 1015, no albumin, no sugar; pale, cloudy, and with granular casts; the daily quantity was thirty-two ounces. On June 14, 1893, Dr. Wm. H. Thompson referred her to Dr. Starr for treatment by thyroid extract. At this time the diseased condition was far advanced and the general swelling marked. The mental symptoms were especially prominent; melancholia, apathy, hallucinations, and vivid dreams existed; marked dysphagia but no dyspnœa. Eyes nearly closed

FIG. 1.



and characteristic arch of eyebrows present. Temperature 97° and 98° ; constipation. She was practically confined to her room. Thyroid extract from glands of old sheep with average weight of each lobe 189 grains, was given, beginning dose being gtt. vi, t. i. d.

July 6. Dose of extract was at this time gtt. x, t. i. d., and although the temperature had at times risen to 99.2° and was uniformly more nearly normal, the condition of the patient was practically unchanged. She was now given gtt. vii, t. i. d. of an extract which, though seven months old, was made from young glands averaging $19\frac{1}{2}$ grains for each lobe.

19th. Since the change that was made in the extract ten days before, the constant elevation of temperature to above 99° has allowed of only small doses of the extract, varying from five to twenty drops daily, and notwithstanding these small doses the improvement has been marked;

the swelling of the face and body much reduced, the tongue and lips much less swollen and more mobile; she can pronounce "st." The dysphagia was less marked and the patient herself began to have hope. The skin was more natural, and sweating occurred on warm days. Pain was still present in the knees and very severe at the end of the spine. Her general strength was not much improved.

August 1. Extract, gtt. v, t. i. d. Temperature, morning, 97.5°; evening, 99.6°. The improvement had been gradually progressive and she felt in better health and spirits.

September 1. Extract, gtt. xvii, twice daily. Temperature, morning, 98°; evening, 98.5°. Very much improved and took short walks in the open air.

13th. The patient came into town and presented herself at Dr. Starr's office; and at his invitation I was present. Mrs. C. now looks, talks, and acts like a normal woman in good health. She is bright and cheerful. There was some stiffness and slight swelling still existing in the upper lip, her hands were small, and her whole skin soft and natural. She felt strong and well, and younger by many years, and looked so. She occasionally stains her pillow with the bloody mucus from the mouth. She occasionally had rheumatoid pains, and the anæmia was not improved.

CASE III.—Mrs. D., aged fifty-six years. The family history in this case is entirely negative. The patient had had only two children, both dying in infancy. Severe hemorrhage followed the birth of the last child, twenty years ago. Rapidly increasing paresis of all the muscles began ten years ago, and was the first symptom of the disease, and this became so pronounced that she walked with difficulty and could not hold up her head, which fell forward. The swelling soon came on, and with it darkening of skin of hands and face. For the last five years the skin has been dry and scaly and thickened, and all the other symptoms of the disease have gradually appeared, and to-day the picture presented is characteristic. There have been periods of improvement without known cause, and she is better in warm weather. She is very feeble and looks like an old woman, and in this case the analogy to senility pointed out by Vermehren is striking. Treatment was begun on October 19th. Extract of lambs' thyroids (gr. xxiv-3j) being used in doses of five drops t. i. d.

November 1. Improvement already manifest and patient feels stronger. Mind less confused and memory better. Dysphagia nearly gone. Extract in doses gtt. x, t. i. d.

10th. Swallowing, speech, and hearing nearly normal. Desquamation ceased and discoloration fading from hands and face. Paresis disappearing and has discarded cane. Swelling much less. Hair ceased falling and upon scalp new hair coming. Anæmia not improved. Extract, gtt. x, t. i. d., continued.¹

CASE IV.—D. D., female, aged five years. Born in Boston, of New England parents, who are persons of more than ordinary intelligence. No history of thyroid disease in the family of either parent. Mother partial invalid from neurasthenia for some years, both before and since marriage; she has irritable and rapid heart, is somewhat anæmic; her eyes are large, but exophthalmia is not present. During this pregnancy,

¹ November 22. Cerebral hemorrhage and complete hemiplegia.

her first and only one, she was ill for five weeks with tonsillitis, and during the second month she broke the third rib on the right side by an accidental blow from a hammer. No special worry was present, but vomiting persisted during the entire pregnancy. Delivery was instrumental and under ether anæsthesia, and the cord was around the neck. At birth the child weighed eight pounds and seemed normal in action and appearance. Nothing was noted until at three months, when the tongue seemed thick and the baby was pronounced tongue-tied. Her weight was then fifteen pounds and she seemed a normal child with the exception of the tongue and a state of chronic constipation. When four months old she cried at night a great deal and suffered from attacks of spasmodic dyspnœa. At six months it was noticed that the child had ceased to grow and was losing in weight, and this was attributed to the

FIG. 2.



nursing of the child by the mother, who was not at all strong. When eight months was reached it was appreciated that the child was far from normal, for the swelling of the face, the protrusion of the large and swollen tongue, and the lack of mental and physical development was painfully apparent to all. At eleven months the child was weaned, and the dysphagia was so marked as to necessitate feeding with a dropper. When two years old the two lower incisors appeared, but were small and soon discolored. At three years the general swelling was at its worst. During her fourth year epileptiform convulsions were frequent, some days as many as a dozen.

Last August the child came under the observation of Dr. G. F. Merrill, of Kennebunkport, Maine, and then for the first time the condition was recognized as being myxœdema, and I was asked to see the patient. The condition, both mental and physical, presented was that characteristic of the disease. Though five years old the child was of the size of a ten months' infant. The lordosis and the large prominent

abdomen were especially marked; and the tibiæ were quite bowed in the lower third. The swelling of the face, nearly closing the eyes (Fig. 2), the marked mental apathy, and the protrusion of the tongue, gave the face the appearance of absolute intellectual vacuity. But on closer examination it was found that some degree of intelligence did exist, though the power of mental perception was very slow. Her attention was attracted with difficulty, and even a lighted match moved in front of her face was not followed by the eyes. Only loud noises would cause her to turn, and these she seemed unable to locate. No expression of face or body showed any response when she was called by name. Her disposition was good. When placed upon her back, upon the floor, she would, after many ineffectual attempts and much labor, succeed in turning over on to her face and belly, where she would lie exhausted by the effort. When sat upon the floor, she seemed incapable of maintaining the balance of the body, and would topple over without any effort to save herself or any fear as to the possible consequences. The condition of the skin was marked, and the hair on the head was thin and coarse and was also present upon the forehead and sides of the face. The axillary temperature ranged between 97° and 98°. A considerable degree of anæmia existed. Upon September 1st, the treatment with extract of lambs' thyroids, gr. xxiv to the drachm, was started with a beginning dose of one drop t. i. d. This was gradually increased until four drops were given, and the temperature caused to rise to 99°. Within a week, a letter received from Dr. Merrill stated that a change for the better was manifest, and on September 16th the father informed me that the appearance of the child was much improved and that she "noticed more." Upon September 27th, the child was brought to New York to remain under my personal observation. At this time, five drops t. i. d. were taken, and the temperature was normal. The swelling of the face and body was much reduced, the lips less prominent, and the tongue smaller and much more movable, and could be kept within the lips but not within the closed jaws. The skin was much softer and not so dry. The bowels were normal. She was certainly brighter, and looked up into the face of anyone approaching, and when her name was spoken would turn her head in the direction of the voice.

On the 5th and 6th of October, the temperature, which had been gradually rising upon fifteen and sixteen drops daily in three divided doses, reached 101° at midnight; and on the 7th, the dose was reduced to three drops three times a day. The improvement in the child's condition, bodily and mentally, during the previous ten days had been remarkable. Her appetite was much increased and her bowels were normal. The swelling of the face, body, and extremities was much reduced, and the natural lines of the face were beginning to show. The urine was much increased in amount. She did not sleep so much nor so well since the beginning of the treatment, and she cried more.

16th. This patient had continued to improve steadily, and at this time the manifestations of the disease which still remained were those which it takes time to grow away from. (Fig. 3.) Her mental aspect had improved even more than her physical condition, and on account of the increased mobility of the features, and the greater bodily activity displayed, her intellectual processes were more apparent. She looked with interest on surrounding objects, and when held before a third-story window followed with her eyes the passing persons, horses, and even

dogs. She made her wants better known, kicked her legs about, and when lying upon the bed her arms and legs would be in constant motion. When put upon the floor, with a little coaxing she would roll over and over as many as ten times. She used her hands as prehensile members, and she showed a disposition to learn to walk, but I discouraged

FIG. 3.



this until her body should weigh less and her legs be stronger, because of the tendency to bow-legs. Five teeth have appeared, and they seem sound and good. Only twice has she had convulsions since the beginning of the treatment. The following comparative measurements are of interest as showing the general diminution in the bulk of the body and the increased growth, between the two dates given—a period of about seven weeks.

	September 27.	November 14.
<i>Circumferences—</i>		
Skull: Occipito-mental	Inches. 21½	Inches. 21
Horizontal	19½	18½
Face	19	18
Neck	12½	11
Right arm	5½	5
Left "	5½	5
Right forearm	5½	5½
Left "	6	5½
Left thigh	9½	9
Left leg	7	6½
Upper chest	19½	20
Lower "	21½	20
Abdomen	19	19½
<i>Lengths—</i>		
Right arm	4	4½
Left "	3½	4½
Right forearm	4	4½
Left "	4	4½
Lower extremity, left	10½	11

We must bear in mind that in treating congenital myxœdema we have not a pre-existing condition back to which we can bring our patients; but in these cases the first step in the treatment is to restore the health, and the second step is to maintain the child in a normal condition, so that the development of its mind and body will progress as in any other healthy child of the same apparent age. That such development will take place I feel sure, but until the cases have been kept under observation and treatment for some years, absolute proof cannot be had. It is my belief that if we break away from the term cretinism, with its vivid picture of the "pariah of Nature," and look more closely for the symptoms of myxœdema, we will find that many so-called idiots, imbeciles, cases of arrested development, etc., among children, are in fact cases of functional inactivity of the thyroid gland, and hence susceptible of treatment by thyroid extract, with improvement, and perhaps even cure.

The effects of thyroid administration may be summed up as follows:

Increased metabolism; shown by—

1. Elevation of temperature.
2. Increased appetite, with more complete absorption of nitrogenous foods.
3. Loss of weight, with nitrogen excreted in excess of that taken in the food.
4. Growth of skeleton in the very young.
5. Marked improvement in body nutrition generally.
6. Increased activity of mucous membranes, skin, and kidneys.

The rheumatic symptoms and the anæmia are not only not relieved, but are most frequently aggravated.

152 WEST FIFTY-SEVENTH STREET, NEW YORK.

MUSCULAR CRAMP, IN RELATION WITH THE PHENOMENA OF ANGINA PECTORIS AND "INTERMITTENT CLAUDICATION OF THE EXTREMITIES."

BY F. PARKES WEBER, M.A., M.D., M.R.C.P. (LOND.)

EDWARD JENNER,¹ founding his views on observations of his own and others, first suggested the "coronary" theory of angina pectoris—that is, the theory which supposes angina pectoris to be due to disease of the coronary arteries—which was afterward supported and developed by

¹ See his letter in "An Inquiry into the Symptoms and Causes of Syncope Anginosa," by Caleb Hillier Parry, M.D., Bath, 1799, p. 3.

Parry,¹ Kreysig,² Reeder,³ etc. H. Huchard, of Paris, has recently in an admirably clear manner formulated his views on the subject (*Maladies du Cœur*, 2d ed., Paris, 1893). Huchard fully supports the coronary theory as far as true angina pectoris⁴ is concerned; he thinks that it is a cramp of the heart-muscle, at first suggested in 1768 by Heberden,⁵ and considers it to be a condition of the heart analogous to that in the limbs, which has been described by Charcot as "claudication intermittente des extrémités." Huchard thus unites the "coronary," "cramp or spasm," and "claudication intermittente" theories of angina pectoris.

According to this author, the case stands as follows: H. Bouley, Jr.⁶ (1831), described an affection of the extremities in horses, to which he gave the name of "claudication intermittente." In this rare affection the horse's hinder extremities are usually affected. The animal goes naturally for some distance, but after some time commences to limp, and then, if whipped on, appears to suffer greatly, and at length something like the following takes place: The animal falls down, is evidently in great pain, and there appear to be anæsthesia and a condition of rigidity in the affected extremities. These phenomena gradually pass off in half an hour or so; the animal regains its natural appearance, but, if whipped on again, the attack will recommence, and so on. At necropsies upon such horses, obliteration of the main artery of the affected limb (the abdominal aorta in cases where both hinder extremities were affected) has been found, and this obliteration of the arterial channel may be from thrombosis, pressure by a tumor from without, etc., but the precise nature of the cause does not affect the present subject under discussion.

Charcot (1858) described similar symptoms in a man.⁷ In all cases the cause is arterial ischæmia of the affected extremity, due to the obliteration of the main artery supplying it, and the collateral circulation, though sufficient when the limb is at rest, is quite insufficient during exertion when an increased blood-supply is demanded. The condition, then, is a premonitory sign indicating the danger of gangrene, and

¹ Parry: Op. cit.

² See F. L. Kreysig: "Die Krankheiten des Herzens." Berlin, 1816, Pt. II. pp. 543-546.

³ H. Reeder: "A Practical Treatise on the Diseases of the Heart." London, 1821.

⁴ He separates from true angina pectoris the nervous affections which he designates as "pseudo-anginas," a term previously employed by Dr. W. H. Walshe in "Diseases of the Lungs and Heart," 1st ed., 1851, p. 435.

A. Lartigue already in 1846 distinguished what he called "pseudo-angina," or "pneumo-gastralgia" from true angina pectoris. See "De l'Angine de Poitrine." Paris, 1846, p. 112.

⁵ See William Heberden, the elder: "Some Account of a Disorder of the Breast," in Med. Transactions of the Coll. of Phys. in London, 1772, vol. II. p. 64. Heberden's account of angina pectoris was read in 1763, the same year in which it was independently, though less thoroughly, described in France by Rougnon.

⁶ Arch. Gén. de Médecine, vol. xxvii., Paris, 1831, p. 425.

⁷ Soc. de Biologie, Comptes-rendus, 1858, vol. V. p. 225 et seq. The part affected was the right lower limb of a man, aged fifty-four, who suffered from aneurism of the right common iliac artery. See also later papers by Charcot and others.

Charcot narrates that one of his patients suffering from this affection subsequently underwent amputation of his leg for gangrene.

According to Huchard,¹ Dr. Potain was the first (1870) to point out the analogy between "claudication intermittente des extrémités" and angina pectoris, and to strengthen this analogy it may be stated that one of Charcot's patients, suffering from intermittent claudication of an extremity, subsequently died in an attack of angina pectoris.

If this analogy be strictly accepted, the coronary-ischæmia² resulting from stenosis of the coronary arteries causes the cardiac muscle to fall into a state of spasm, just as the limb in Charcot's cases of "claudication intermittente des extrémités." But if angina pectoris is really due to spasm of the cardiac muscle, how is it that the pulse may appear, at least in some cases, unaffected or comparatively little affected during the attack?

Such is the difficulty when the *heart* is concerned, but even in *intermittent claudication*³ of the *extremities*, in spite of Charcot's cases, perhaps it may be asked if cramp forms a necessary feature. Charcot thought it was allied in nature to rigor mortis, but an earlier observer who apparently alluded to cases of the same nature (though he did not use the same term as Charcot), made no mention of either rigor-mortis-like rigidity or ordinary cramps in his description. I refer to Sir Benjamin Brodie, to whose writings on this subject my attention was directed by Mr. Maidlow.

Charcot, who described his first case in 1858, considered intermittent claudication of the extremities as a warning sign of impending gangrene; and Sir Benjamin Brodie, in 1846 (*Lectures on Pathology and Surgery*, London, 1846, p. 360), when describing the premonitory signs of senile gangrene, though he did not use the term "intermittent claudication," evidently alluded to the same class of phenomena as Charcot. Brodie must therefore, I think, be considered as having not only described the condition in man before the celebrated French doctor, but, as may be seen from the following quotation, he at the same time clearly drew up the analogy between it and angina pectoris.

¹ H. Huchard: "Maladies du Cœur." 2d ed., Paris, 1893, p. 608.

² On the subject of coronary ischæmia some of Cohnheim's experiments are remarkably interesting. See Cohnheim's "Lectures on General Pathology," New Sydenham Society's Transactions, 1889, vol. i. p. 35. After recalling the experiments of Von Bezold, Samuelson, and his own, he states that the ischæmia in such experiments probably produces its baneful effect through the action of the cardiac ganglia. He goes on to point out the difficulties in the way of accepting the "coronary" theory of angina pectoris. It must be remembered, however, in such experiments that the lesions are acute and affect a previously healthy cardiac muscle. The experiments do not, therefore, necessarily afford an analogy with what takes place when the coronary arteries become gradually stenosed by disease.

³ This term admits of being used in English, and is, perhaps, as satisfactory as "meioprægie," the other term used by Huchard, and which he states that he has borrowed from Dr. Potain (Huchard, op. cit., p. 209).

Brodie's exact words are :

"If you cross-examine a patient who has mortification of the toes, he will generally tell you, that for three or four years preceding, he has had occasional pains in the lower limbs; a sense of numbness in them; that his feet were liable to be cold; that when they again became warm, after having been cold, they have been very painful; and that he has had a sense of weakness of the muscles. Such patients walk a short distance very well, *but when they attempt more than this the muscles seem to be unequal to the task, and they can walk no further. The muscles are not absolutely paralyzed, but in a state approaching to it.* The cause of all this is sufficiently obvious. The lower limbs require sometimes a larger and sometimes a smaller supply of blood. During exercise a larger supply is wanted on account of the increased action of the muscles; but the arteries being ossified or obliterated, and thus incapable of dilatation, the increased supply cannot be obtained. This state of things is not peculiar to the lower limbs. Wherever muscular structures exist the same cause will produce the same effect. Dr. Jenner first, and Dr. Parry, of Bath, afterward, published observations which were supposed to prove that the disease which is usually called "angina pectoris" depends on ossification of the coronary arteries. . . . When the coronary arteries are in this condition they may be capable of admitting a moderate supply of blood to the muscular structure of the heart; and as long as the patient makes no unusual exertion, the circulation goes on well enough; when, however, the heart is excited to increased action, whether it be during a fit of passion, or in running, or walking up stairs, or lifting weights, then, the ossified arteries being incapable of expanding so as to let in the additional quantity of blood which, under these circumstances, is required, its action stops and syncope ensues; and I say that this exactly corresponds to the sense of weakness and want of muscular power which exists in persons who have the arteries of the legs obstructed or ossified."

From this quotation it may be seen that Brodie, whilst clearly describing an intermittent claudication of the extremities, certainly did not consider cramp or other rigidity of the muscles to be a necessary accompaniment. Conversely, the following case shows that cramps in an extremity, though induced by arterial obliteration, may be unaccompanied by the other features of intermittent claudication of the extremities. The case is that of a man who, in 1889, had his left common (?) iliac artery obliterated from an accident. He is now able to get about fairly well, and has not noticed anything analogous to intermittent claudication of the limb as described by Charcot, though, when sleeping with both legs drawn up, he is awakened by cramp in the left leg (only). Here are some short notes of the case, which I am enabled to give through the kindness of Sir William Savory, whose house surgeon I was when the man was admitted at St. Bartholomew's in 1889.

Michael M., aged forty-one years. Admitted December 20, 1889; discharged May 30, 1890, for the Convalescent Home. The diagnosis in the case-book is "Injury to spine and abdomen—occlusion of left common iliac artery; partial paralysis of left lower extremity."

Following is a short abstract of the most important features :

The patient was crushed between buffers of engine and stage; very much collapsed; numbness of left leg; pain and tenderness in lower part of back and abdomen; loss of power over left leg; complete loss

of sensation below middle of thigh except over an area somewhat corresponding to that of the small sciatic. Pulsation in left posterior tibial artery could just be felt. Marked tenderness over lower part of abdomen. A distinct tumor (perhaps of extravasated blood?) could soon be felt in left inguinal region of abdomen.

Dec. 26, 1889. Bowels opened (without medicine) for the first time since admission.

27th. Can move thigh fairly, not leg or foot.

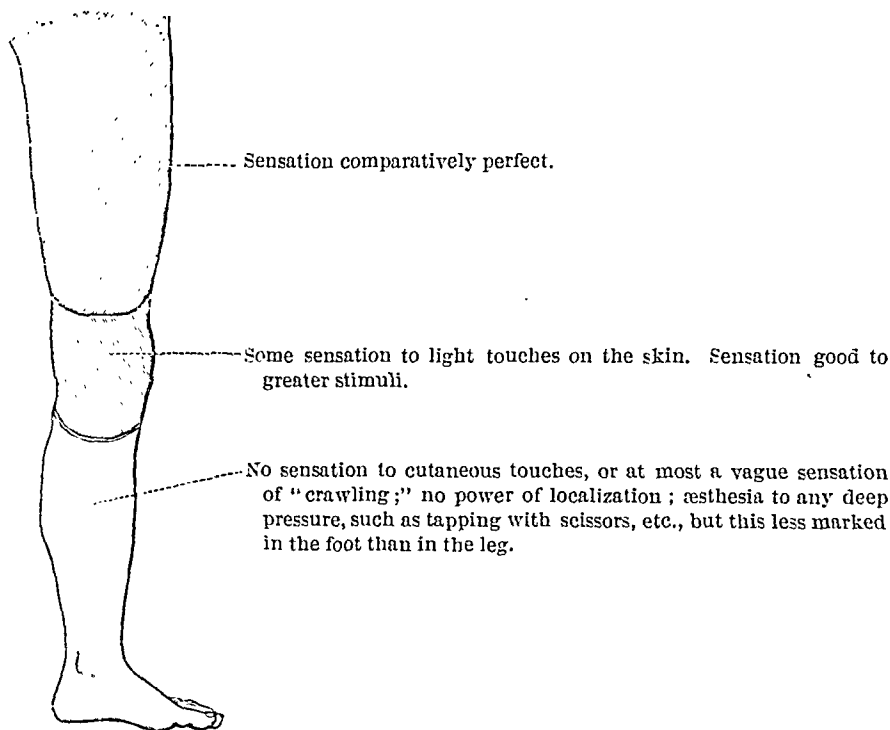
31st. Certainly no pulsation in femoral. Discoloration of heel.

Jan. 1, 1890. Very slight pulsation made out in femoral.

8th. Gangrenous patch formed on outside of leg.

10th. Sensation returning in leg slightly; gangrene of heel.

The sloughs separated and the sores became healthy. Anæsthesia appeared to be gradually and partially clearing up and power of motion to be returning. On May 30, 1890, could raise the leg from the bed. Following is a diagram of the anæsthesia in the limb on May 16, 1890:



Patient seen again in November, 1893.

Had had in the meantime gangrene of portions of the toes of left foot and had undergone tenotomy of the left tendo Achillis (with wrenching of the ankle-joint) on account of the left foot having become fixed in position of equinus.

Very faint pulsation can be felt in the left femoral artery. There is still considerable impairment of sensation in left lower extremity. Over the greater portion of the front of the leg below the knee, and over part of the sole of the foot, superficial sensation is entirely absent (as tested by gentle touching with a pin, etc.), but there is hyperæsthesia for deep

sensation, especially when pressure is applied over the shin. Perhaps some of this tenderness is periosteal. The left leg feels colder to the touch than the right one. The left lower extremity is decidedly somewhat wasted, especially at the calf. He does not complain of any symptoms on walking analogous to "claudication intermittente des extrémités" as described by Charcot in man. He walks about fairly well considering that in spite of the operation there is still partial ankylosis in the left ankle-joint. A curious fact is that when lying in bed and asleep he is sometimes awakened by cramp in the left leg. This is only when he goes to sleep with his legs drawn up, and although both legs be drawn up, the cramp is only in the *left* leg.

An explanation of ordinary¹ muscular cramps (such as those sometimes affecting the legs of healthy persons after violent exertion and at night time) is that they are due to the irritation caused by the accumulation of waste products in the affected muscles. By the waste products the endings of the centripetal nerves in the muscles are irritated and the cramp or tetanic contraction is a reflex result. This theory explains the frequency of cramps on going to sleep, for the commencement of sleep favors reflex movements and cramps are perhaps merely an exaggeration of the jerking movements in limbs which in some people not infrequently wake them up just as they are dosing off. This theory of cramps accounts, moreover, for the tendency to their occurrence in healthy people after violent physical exertion, such as rowing in a race, etc. The violent exercise causes an excessive catabolic process in the muscles and consequently such an accumulation of waste products in these parts that even a healthy circulation takes considerable time to remove them. In the meantime there is a tendency to cramps in the muscles which have been most used, and a rowing man who assures me of the frequency of cramps after violent rowing says that, when they occur, they do not necessarily follow immediately after the exercise, but may come on at any moment for some time afterward. The same theory of cramps accounts also for the peculiarity of their occurrence in the patient Michael M., whose case I have just given. In his case they occur only when sleeping "with his legs drawn up" and are limited to the left lower extremity. This is the extremity in which the blood-supply is defective, owing to the obliteration of the common(?) iliac artery on that side, which took place some years ago. In his case probably the blood-supply furnished by the collateral circulation is insufficient and has difficulty in washing away the waste products, and this difficulty is increased when the position of the patient in bed ("with his legs drawn up") renders the circulation in the extremity still more

¹ Of course cramps may arise from different causes. They need not be reflex, but may arise from direct stimulation (experimental or due to disease) of any part in the nervous motor tract. The cramps of cholera, however, and of choleraic diarrhoea may be due in part to the accumulation of waste products, which the sluggish blood-stream and diminished quantity of blood are insufficient to clear the muscles of.—Cf. Dr. P. Z. Murphy, *Lancet*, 1853, vol. i. p. 511.

defective. Hence the cramps in that extremity at night-time, the time which favors reflex movements.

If the "waste-products" theory of muscular cramps be correct, then it is not surprising if, quite apart from Charcot's rigor-mortis-like rigidity, ordinary cramps should occur frequently in such patients as those whose cases Charcot has described under "*claudication intermittente des extrémités*," since this is a condition primarily due to arterial ischæmia, and in which the waste products are imperfectly washed away. These cramps, however, need not necessarily be associated with intermittent claudication of the extremities, and the previous quotation shows that Brodie did not attach great importance to them. It is, I think, the powerlessness described by him, rather than cramps or rigor-mortis-like rigidity, which is to be considered as the essential part of "intermittent claudication of the extremities."

I will endeavor to make my meaning clearer by the following consideration: "*Claudication intermittente*" is obviously a question of degree; a muscle imperfectly supplied with blood cannot do as much work as one properly supplied, but a limit to the possible work exists in both cases, easily reached in the former, but only on the most violent exercise in the latter. Thus an athlete in a race may, so to speak, "use himself up" completely, so that at the end of the race he is incapable of any further exertion. This is really nothing but a "*claudication*" in a healthy man, exactly analogous to "*claudication intermittente*" in the extremities of patients with diseased arteries. It is noteworthy that when a man has undergone continued violent muscular exercise cramps may follow, but in this case no cramp necessarily takes place at the moment of giving up; on the contrary, as I have already mentioned, a tendency to cramps may exist for some time after. These considerations, I think, illustrate the subject under discussion and really help toward explaining the relation of the cramps to the sudden feebleness in "*claudication intermittente*" of the extremities, namely, that both are favored by the same condition, which is stenosis of the main artery of the affected part.

From the extremities I shall now return to the heart, and think the same considerations have some bearing on the subject of angina pectoris. If, as seems probable, angina pectoris is really a "*claudication intermittente*" of the cardiac muscle, due to coronary ischæmia, then, as in the extremities, cramps will not be a necessary feature; and, indeed, the pulse almost precludes the idea that ordinary angina pectoris is a cramp of the heart-muscle. It will then be asked: When the main arteries are stenosed, why should not cramps be likely to occur in the heart as in the extremities? It probably does occur¹ at times, and is expressed

¹ A cessation of the heart's action in systole (or spasm) is probably the most frequent form of cardiac syncope.

by syncope, which¹ may be the fatal termination in angina pectoris.² According to this view one may discard the "cramp" or "spasm" theory of angina pectoris, whilst still retaining the "intermittent claudication" theory, regarding the latter term as synonymous with the "coronary" theory, and as affording the explanation of the phenomena of true angina pectoris; when it is accompanied by syncope, then, and then only, can cramp of the heart be considered as playing any part in the *ensemble* of an attack of angina pectoris.

I will only add a few words, and these are regarding the "coronary" theory of true angina pectoris, which I have almost taken for granted in the foregoing words, but which seems to be as yet not universally accepted. A chief objection to the "coronary" theory is that stenosis of a coronary artery may be found post-mortem in individuals who have never been known to suffer from angina pectoris. This has been accounted for by anastomoses in the coronary circulation (see those pointed out by Dr. Samuel West, *Lancet*, 1883, vol. i. p. 945, and others). The alleged cases of true angina pectoris without organic disease³ of the coronary arteries form a second objection to the "coronary" theory; but in these cases spasm of the coronaries may explain the attacks, as was maintained in the fatal case attributed by Huchard to the poison of tobacco (see Huchard, *op. cit.*, pp. 626 and 712). These are the chief objections to the "coronary artery theory," and they are

¹ This is the real justification for the name "syncope anginosa," suggested by Parry. Parry wrote: "I think it evidently appears that the angina pectoris is a mere case of syncope, or fainting, differing from the common syncope only in being preceded by an unusual degree of anxiety or pain in the region of the heart," etc. See Parry, *op. cit.*, p. 67.

² If angina pectoris were a cramp of the heart the pain or anguish felt during the attack might be explained by supposing the nerve-endings to be stimulated by the contraction of the heart-muscle; which explanation would make the sensory phenomena of angina pectoris analogous to the pain felt during cramp in the calf of the leg. If, however, as I maintain, angina pectoris be not necessarily associated with cramp of the heart, another explanation must be adopted, such as that the pain is directly dependent on anæmia of the myocardium (Cf. Huchard, *op. cit.*, pp. 618 and 619). This would make it analogous to the pains long ago recognized (see Percivall Pott, *Chirurgical Works*, 1775, p. 791) as premonitory signs in senile gangrene; the accumulation of waste products may likewise have something to do with its production, as in the production of the more chronic pains or "stiffness" in the limbs after violent exertion.

³ On this question some of the earlier recorded necropsies are particularly interesting. In the first necropsy on a case of angina pectoris, recorded by Heberden, nothing to account for death was found. A gentleman had apparently heard of Heberden's description of angina pectoris, and considered that the symptoms corresponded with his own. Accordingly, on April 16, 1772 (see *Med. Trans. Coll. Phys.*, London, 1785, vol. iii. p. 1), Dr. Heberden received a letter, signed "Unknown," from the gentleman describing his symptoms, and saying that he had left directions that, after his death, Dr. Heberden should have an opportunity of dissecting his body to find out the cause of the disease. The gentleman died suddenly within three weeks afterward, and Heberden obtained the services of Mr. John Hunter to make the examination, but no pathological change likely to cause death was discovered. Jenner (see Jenner's letter to Parry, in Parry, *op. cit.*, p. 3), however, thought that in this case the coronary arteries were not examined. In a later case, examined by Hunter (narrated by Dr. J. Fothergill, in *Medical Observations and Inquiries*, 1776, vol. v. p. 225), ossification of the coronary arteries was found, and on Hunter's own death, in 1793, from angina pectoris, Sir Everard Home, forewarned by Jenner, discovered that the coronary arteries were diseased.

not unanswerable; whilst, on the other side, the well-known action of nitrite of amyl and trinitrin affords support to this theory. The beneficial action of nitrite of amyl in some cases of angina pectoris was first discovered by Dr. Lauder Brunton,¹ and has since been abundantly confirmed. He considered that it acted by lowering the peripheral resistance to the arterial stream and thereby diminishing the amount of the heart's work. It is obvious, then, how this therapeutic explanation of Dr. Brunton may be adduced in support to some extent of the theory that in patients with angina pectoris the coronary arteries are stenosed, and that, owing to this, the blood-supply to the cardiac muscle is limited, allowing it to do only a limited amount of work.

More detailed evidence from post-mortem statistics as to the presence of coronary disease in fatal cases of angina pectoris is given, amongst recent authors, by Huchard,² and it would be out of place to repeat it here; this paper deals with the part played by cramp in angina pectoris, and the "coronary" theory has been practically assumed.

It now rests with me to recapitulate the chief points in my paper:

True angina pectoris has long been separated from the nervous cases, or "pseudo-anginas;" it has been regarded as due to stenosis of the coronary arteries and as analogous to certain premonitory signs of dry gangrene, due to stenosis of arteries in the extremities. In the present paper I do not pretend to have discussed these questions in their entirety, but have confined myself to the rôle played by muscular cramps in relation to the other phenomena. In this paper it is maintained that muscular cramp does not take any necessary part in angina pectoris or in the phenomena preceding senile gangrene in an extremity, but that cramp is likely to occur in any muscle where an accumulation of waste products takes place, whether this accumulation be caused in healthy muscles by rapid catabolism due to excessive exercise, or by insufficient removal of the waste products in cases of disease due to stenosis of the main arteries and consequent diminution of the blood-stream through the affected part. It is further held that these cramps, when they do occur in angina pectoris, are expressed by the syncope, which may accompany the attack and lead to a fatal termination.

¹ See Dr. Lauder Brunton: "Nitrite of Amyl in Angina Pectoris," Clin. Soc. Reports, February, 1870, vol. iii.

² Huchard, *op. cit.*, pp. 798-817.

COMPOUND TINCTURE OF COAL TAR.

BY LOUIS A. DUHRING, M.D.,
PROFESSOR OF SKIN DISEASES IN THE UNIVERSITY OF PENNSYLVANIA.

THE preparations of coal tar, in the form of tinctures, from a pharmaceutical standpoint, are not well understood. When they are prescribed the pharmacist dispenses either a preparation of which he may hold the formula (and regards as his own property) or some proprietary article, and so labelled. In some cases the preparation dispensed proves to be indifferently made or valueless, in other cases (as the writer knows from experience) to be positively harmful. In this communication will be given the results of a series of experiments made by Mr. J. M. Baer, apothecary, and the writer, which were undertaken with the view of obtaining the most desirable and elegant pharmaceutical and therapeutical preparation for external use. It is not necessary to refer to all the numerous formulæ considered. It will suffice if the more important are mentioned, the object being to introduce a good local remedy together with the working formula, so that it may in a measure supplant certain similar proprietary preparations and be brought within the reach of all. This article, therefore, may be regarded as an abstract of the work done.

It may be stated that the more valuable published formulæ of the so-called coal-tar tinctures may be divided into two groups: (1) those containing alkalies, and (2) those made with tincture of quillaia bark or tincture of elm bark. Some of them are old, and have been published and republished, more or less accurately, chiefly in foreign journals, while others are modifications of them. The literature on the subject, however, is meagre and unsatisfactory, so that any contribution to the subject must be welcome. The experiments made may be classed into those which contain:

1. Coal tar and alcohol.
2. Coal tar and potassa or soda.
3. Coal tar and tincture of quillaia.
4. Coal tar and tincture of elm.
5. Coal tar and tincture of quillaia, potassa or soda.

Some of these may be briefly referred to before presenting the formula selected as being the best. The object desired was a good product pharmaceutically, containing the therapeutic virtues of coal tar, and in particular a product miscible with water.

A simple formula, but one not to be recommended, consists of coal tar, 10 parts; alcohol (95 per cent.), 24 parts. Diluted with water 1:8, this forms a dingy, orange-yellowish, densely cloudy mixture, manifestly not homogeneous; an oily substance variegated in color floats on the surface

and adheres to the sides of the glass test-tube. The addition of water causes an oil or oily products to be separated, thereby rendering it an undesirable mixture, both pharmaceutically and therapeutically. This product is sometimes dispensed when "tincture of coal tar" is called for, but it is a mischievous fluid, liable to set up a dermatitis, for the reasons given.

The action of caustic soda and potassa on coal tar is to emulsify it, but emulsification occurs only when strong solutions are employed. Upon the addition of water the mixture becomes cloudy and the coal tar separates. This fact was pointed out by Le Bœuf.¹ McCall Anderson,² many years ago, in speaking of the value of tarry preparations in eczema, gave the following formula for an emulsion, which he stated had the advantages of being both serviceable and cheap:

R.—Coal tar	.	.	.	.	.	.	.	.	5ij.
Alcoholis	.	.	.	.	.	.	.	.	5ij.
Cola et adde									
Liq. ammon. fort.	.	.	.	.	.	.	.	.	℥viiij.
Glycerini	.	.	.	.	.	.	.	.	5vj.
Aq. dest.	.	.	.	.	.	.	.	ad	5xij.

This formula makes an opaque, milky, dirty-brownish emulsion, which can be further weakened with water in all proportions. It forms no precipitate. The amount of glycerin seems to the writer to be unnecessarily and objectionably large. Diluted one part to fifteen of water, it is slightly cloudy and of a light brownish-yellow color. Owing to the small amount of alcohol it contains, it is a weak preparation and one which requires less dilution than the other formulæ mentioned.

The action of a caustic upon coal tar is illustrated in the following formula, containing tincture of elm, which has been published as a desirable formula: Take of coal tar, 5ij; solution of caustic potassa, 5° Beaumé (5 per cent. solution) (5j-5ij), sufficient to make a thick, grayish mass. Stir and allow to stand, stirring frequently for several days. Pour off the liquid and mix with one gallon of tincture of elm (one pound to a gallon). This is an alkaline solution, containing about five grains of caustic potassa to the ounce. Diluted with water 1:8, it produces a clear, brownish solution with a precipitate. Upon the whole, the results obtained with the many formulæ containing coal tar and alkalies were not satisfactory, most of the products when water was added showing more or less precipitation.³

Reference may now be made to the action of tincture of quillaia on coal tar. Le Bœuf, in France, about 1860, was the first to make use

¹ Pharmaceutical Journal, 1866-67, second series, vol. viii., p. 470.

² Treatise on Eczema. Second edition. London, 1867.

³ It will be borne in mind that coal tar only, and not wood tar, was employed in the experiments, wood tar, as is well known, combining with potassa and making a homogeneous mass, miscible with water.

of this combination under the name of "coal tar saponiné," of which further mention will be made presently. Before taking up the action of tincture of soap-bark on coal tar, the manner of preparing the tincture of soap-bark itself may be discussed, as there exists considerable variation in the several published formulæ. Some are made with alcohol, 57 per cent., others with 95 per cent. strength, and the proportion of bark also varies. The London and Westminster Hospitals (according to *Squire's Pharmacopœia of the London Hospitals* for 1891) give this formula (which is 1:4):

Quillaia bark (inner) bruised	℥v.
Alcohol, 90 per cent.	℥xx.

Heat to ebullition and filter.

Guy's Hospital gives the following:

Quillaia, coarse powder	℥iv.
Rectified spirit	℥xx.

This formula contains somewhat less of the bark (1:5). The British Pharmaceutical Conference adopted the formula of 1:8. Le Bœuf makes a strong tincture—1 part of coal tar to 4 parts 90 per cent. alcohol. Our own experiments show that a strong tincture, 1 part to 4, 95 per cent. alcohol, is the best, and this may be accepted as a standard.

The tincture of quillaia acts favorably upon coal tar, diluted with all proportions of water, forming a homogeneous emulsion. There is no other substance, so far as I am aware, that is able to take its place. Tincture of elm acts similarly upon coal tar, but less satisfactorily as concerns its emulsifying property. It does not possess the cleansing properties of soap-bark. The following formula is that given by Hans Wilder:¹

Tincture of quillaia	4½ pints.
Coal tar	2 pounds.

Digest eight days and filter.

The tincture of quillaia is to be made by percolating two pounds of soap-bark with one gallon of 65 per cent. alcohol. Diluted 1:8, it produces a densely clouded solution of a yellowish-brown color, with a slight precipitate. It is a weak preparation, owing to the small amount of alcohol it contains, and it is doubtful if all the virtues of the coal tar are extracted.

Coal tar saponiné, according to Le Bœuf's formula,² is prepared as follows:

Soap-bark, crushed	1 part.
Alcohol (90 per cent.)	4 parts.

Heat to boiling and filter.

¹ *Pharmaceutical Era*, March 1, 1892.

² *Pharmaceutical Journal*, 1866-67, second series, vol. viii. p. 470.

Of this tincture take twelve parts, and digest for eight days ten parts of coal tar. It is a stable preparation and is miscible with water. Diluted with four parts of water, it constitutes the preparation labelled "coal tar saponiné," ready for use, pure or diluted as may be required. Alcohol of 95 per cent. strength we find makes a better preparation than the 90 per cent. alcohol Le Bœuf's original formula calls for.

The preparation known as "liquor carbonis detergens," manufactured by Wright & Co. as a proprietary article in England, is probably in like manner made with soap-bark. Its properties are much like those of the formula published at the close of this article. Therapeutically it appears to be the same. As a substitute for it the British Pharmaceutical Conference adopted in the unofficial formulary the following formula. Take of

Soap-bark, powdered	3ij.
Alcohol (57 per cent.)	Oj.

Moisten the powder and macerate for twenty-four hours in a closed vessel. Then pack in a percolator and gradually pour on the alcohol. To this add prepared coal tar four ounces. Digest at a temperature of 120° F. for two days; allow to become cold and filter. (Prepared coal tar is commercial coal tar which has been exposed in a shallow vessel to a temperature of 120° F. for one hour, stirring frequently.) Mixed with water 1:8, we find it produces a slight precipitate, the mixture being somewhat milky, and of a pale brownish-yellow color.

CONCLUSIONS.—Summing up the result of these investigations, we may conclude:

1. That the best tincture of coal tar is made with the aid of tincture of quillaia.

2. That the strength of the tincture of quillaia should be 1:4, with 95 per cent. alcohol.

3. That the coal tar (1 part) should be digested with the tincture of quillaia (6 parts), with frequent agitation, for not less than eight days, and preferably for a longer period, and finally filtered.

4. The resultant product is a brown-black, clear tincture, which upon the addition of water forms a cleanly yellowish emulsion, the color and certain other characters varying with the kind of coal tar employed.

5. The tincture is stimulating, and is prescribed usually largely diluted, with from 10 to 60 parts of water, as a wash, and is useful where tar is indicated, as in certain forms of eczema, psoriasis, pruritus, and in other inflammatory diseases of the skin. It is often more useful when employed weak than strong.

6. This preparation, which may be designated as "compound tincture of coal tar," takes the place of several similarly composed proprietary preparations known as "liquor carbonis detergens" and "coal tar saponiné."

EIGHT CASES OF BERI-BERI.

BY HENRY C. BOENNING, M.D.,
QUARANTINE PHYSICIAN OF THE STATE OF PENNSYLVANIA.

ON November 8th information reached me that a number of the crew of the steamship *Lanark*, lying at Pier 30, Bainbridge Street wharf, were ill, and upon visiting the vessel I found six men of a large Hindoo crew prostrated with symptoms pointing to beri-beri. I found the ship to be a fine large vessel, well appointed and officered, tight, and in good sanitary condition. She loaded at Java five thousand tons of coarse sugar and sailed for Perim, where she arrived twenty days later, having had two deaths aboard during the passage. After leaving Perim she reached Port Saïd in seven days, having had another death on board, and two men, who were then sick, were taken ashore and placed in the hospital, but died before the vessel left Port Saïd, the *Lanark* being detained there twelve days. After leaving Port Saïd she sailed for Philadelphia, touching at Algiers and Gibraltar; had no more deaths aboard and arrived here November 2, 1893. An examination of the vessel by Drs. Cleaver and Seymour at the State Quarantine Station, proved that she was in good sanitary condition with no apparent serious illness aboard.

The Bill of Inquiry required at the Station reads as follows:

1. What is the name of this vessel? *Lanark*.
2. What is the rig of the vessel? *Steamship*.
3. What is the name of the commander? *W. B. Cross*.
4. From what port did she start on this voyage? *Java, Sourabaya*.
5. When did she clear this port? *August 18, 1893*.
6. What is her tonnage? *1973*.
7. To what port does she belong? *Liverpool, Eng.*
8. How many men, all told, compose your crew? *60*.
9. How many passengers have you? *5*.
10. How many passengers are foreigners? *5*.
11. Are all the passengers you have taken on board now on board of your vessel? *Yes*.
12. Where were the passengers taken on board? *Cardiff, Wales*.
13. Have you had any sickness on board since the commencement of this voyage? *Yes; three died during the voyage, of malarial fever*.
14. Are all now on board in good health? *Yes*.
15. At what port or places did your vessel touch or trade during the voyage, and at what time did she leave each of them? *Perim, Sept. 11th; Port Saïd, Egypt, Sept. 31st; Algiers, Oct. 8th; Gibraltar, Spain, Oct. 11th, 1893*.
16. Did any sickness prevail in the harbor, or on shore, or at any of said ports or places? *None*.

17. Of what does your cargo consist? Sugar.
18. To whom is your cargo consigned? Franklin Sugar Refinery.
19. To whom is your vessel consigned? R. R. Sneden.
20. Have you a bill of health? Yes.
21. Has any person boarded your vessel since you entered the Capes? None.
22. Has any person left your vessel since you entered the Capes? None.
23. Have you any rags or waste aboard? None.

Upon closer inquiries I found that the men who died all presented similar symptoms: great weakness and emaciation, paresis of the lower extremities, amounting in two cases almost to paralysis; considerable epigastric distress, some vomiting, and more or less œdema of the legs. The fatal cases all died rather suddenly. None of the cases had chills or fever; they simply became weak, dragged their legs, complained of much epigastric soreness, had considerable palpitation and some shortness of breath, fugitive muscle pains, and more or less dropsy.

On November 9th I visited the vessel again and carefully examined the crew. I found six men presenting marked symptoms of the disease. I immediately ordered the entire crew to be isolated and instructed the ship's officers not to allow any visitors aboard the vessel, nor to allow those engaged in unloading the vessel to come in contact with the crew; for I was informed that shortly after the vessel had reached her dock, two men, too ill to work, were sent by the direction of Dr. Rudderow, physician to the British Consulate, to the Medico Chirurgical Hospital, where one died suddenly.

I confess I was much impressed by the facts as I found them. A disease unknown to me in a practical way, affecting twelve persons, of whom six died, a mortality of 50 per cent., decided me to adopt prompt and effective measures, and I ordered the vessel to be taken on Saturday, November 11th, at 12 o'clock, to Quarantine Station, to be treated, her crew to be removed as suspects, and the sick to be sent to the hospital. Friday evening, November 10th, an interview, attended by Health Officer Veale, Mr. Clipperton (British Consul), Captain Cross, and the Quarantine Physician, resulted in a plan, to which all agreed, to permit the vessel to remain at her dock or in stream, to remove the crew to the Quarantine Station at the expense of the ship's representatives, and to burn the bedding and soiled effects of the crew. I immediately telephoned to Dr. Cleaver to report the next morning on board the Lanark and to direct the proper cleansing of the vessel, the instructions being, to have the vessel mechanically cleansed, then drenched with bichloride 1 to 500, and after this to fumigate for twenty-four hours with sulphur dioxide, burning not less than three pounds to every 1000 cubic feet of space. The bedding and soiled effects of the crew were burned. The

work of cleansing the vessel occupied three days. On Saturday afternoon November 11th, thirty-nine of the crew, consisting of firemen, sailors, and stewards, were received at the Station. Of these, eight were found to be sick. They were given a hot bath and then immersed in a 1 to 1000 solution of bichloride, given clean clothes, and sent to the hospital. Thirty-one were housed as suspects in the barracks, but were first given a bath, immersed in a 1 to 1000 bichloride solution, and put into clean clothes. On Sunday, November 12th, I began a careful study of the cases in the hospital.

CASE I.—Mohammed Hafiz, aged thirty-five years, began to feel sick some time in October. He lost flesh, had pains in his body, but was not incapacitated for work until after the vessel had been in port for several days, when his legs began to swell and feel very heavy. His condition on November 12th was as follows: More or less emaciated, weak, and he walked with some effort. His deltoids were sore to the touch and he had considerable muscle soreness through the posterior muscles of the legs. His tongue was very red, beefy; the cardiac area enlarged, both transversely and vertically; rapid but irregular heart action; at the base a well-marked systolic murmur, soft in character, best marked over the tricuspid cartilage. No evidence of pulmonary, hepatic, or splenic involvement. Considerable epigastric tenderness. Cutaneous reflexes absent on the sides of the feet and palms of the hands. Large areas of cutaneous anæsthesia involving the skin of the dorsum of the forearm in both arms, and in the right extending over the shoulder. Entire abdomen below umbilicus anæsthetic. The skin over the dorsum of the foot and anterior and upper lateral surfaces of the leg in both lower extremities insensitive to the prick of a needle or to the application of intense cold or heat. The patellar and ankle reflexes were impaired.

A curious symptom in this case was unilateral sweating. This patient's right arm and the right side of the face were constantly covered with a profuse sweat. An examination of his blood showed a deficiency in the number of red corpuscles, a slight increase in the white; a diminished tendency for the corpuscles to form rouleaux; they seemed to have a tendency to aggregate in scale-like groups, but no foreign elements were observed. The urine showed neither albumin nor sugar, but an abundance of phosphates; it was neutral in reaction and had a specific gravity of 1022. Under treatment this man progressively improved and was discharged, practically well, ten days after admission.

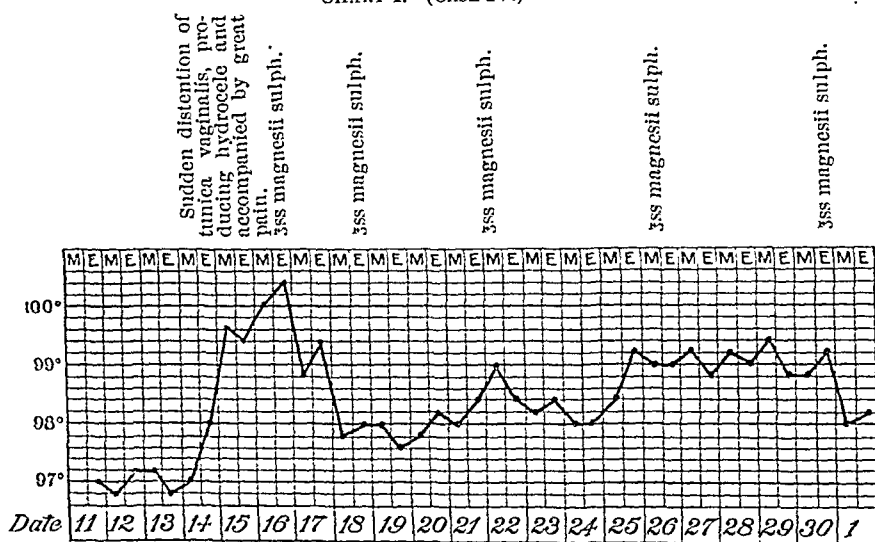
CASE II.—Abdulla Hamed, aged twenty-five years, has been ailing for about two months. Has complained of great weakness in the legs and much soreness of the muscles. He lost flesh rapidly and shows decided atrophy of the anterior muscles of the legs. On admission to the hospital he had a soft systolic murmur, most distinct over the pulmonary artery. He has frequent attacks of palpitation during which the heart rhythm is disturbed. He has considerable epigastric tenderness, some nausea and vomiting, principally of mucus, and occasionally after taking food. No apparent liver or splenic enlargement and but very slight œdema about the malleoli. His urine showed neither albumin nor sugar, and had a specific gravity of 1016. He was hyperæsthetic about the lips and right side of the face; the left side of the face was devoid of sensation. He also presented anæsthetic areas over the ante-

rior and lateral regions of the legs and dorsal surfaces of the feet. His reflexes were well marked, in fact exaggerated. His blood was markedly hydræmic. He was discharged ten days after admission, convalescent.

CASE III.—Sad Bedad, aged forty years; a well-built man. My attention was called to this man on account of the apparent paralysis of the flexor muscles of the feet. I observed that as he walked along the floor he raised his heels very high, dragging his toes. On admission to the hospital he was found to have a well-marked, but soft, systolic murmur transmitted through the tricuspid orifice, but most distinct over the third left intercostal. He had considerable epigastric tenderness; no apparent involvement of the lungs, spleen, or liver; some soreness or tenderness in the right inguinal region, and frequent watery stools. His urine showed neither albumin nor sugar and had a specific gravity of 1026. He had marked dropsy of the legs. There was loss of sensation of the surface of the arms as high as the deltoids, over the præcordia, lower part of abdomen, anterior part of thighs, over the anterior and lateral regions of the legs and the dorsal surface of the feet. He has strongly exaggerated patella and foot reflexes; a tap over the right tendo patellæ produces an almost convulsive response. His blood showed no parasites. He was discharged on November 20, 1893, much improved.

CASE IV.—Saliman Ali, aged twenty-one years, was decidedly weak, his legs were very œdematous, he had much dyspnœa, and presented a double cardiac murmur, irregular heart, pulsating jugulars, throbbing carotids, had diarrhœa, and extensive nerve disturbances. Two days after

CHART I. (CASE IV.)



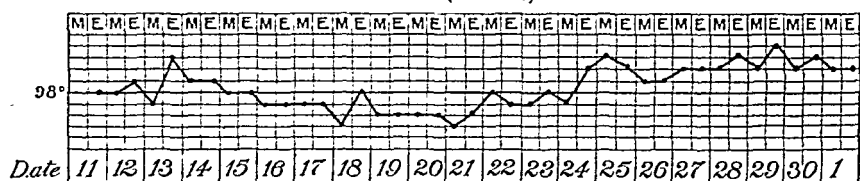
admission this man exhibited a sudden serous effusion into the tunica vaginalis. He also became anasarctous and very short of breath. A careful physical examination showed some pulmonary œdema, a marked enlargement of the cardiac dulness, irregular ventricular action, a strong but soft mitral murmur, a very well marked tricuspid murmur, a well-defined tremor or thrill over the præcordia, and pulsation of the external jugulars. His neck was somewhat œdematous. He had a cough and occasionally raised some frothy mucus slightly tinged with blood. In

this case there was an entire absence of regularity in the action of the auricles and ventricles; the ventricles contracted independently of each other. The nerve disturbance was marked. There was anæsthesia over the upper lip, the lower lip was hyperæsthetic. The right upper extremity presented small areas of anæsthesia; the skin over the entire left upper extremity was devoid of sensation. There was an entire loss of the tactile sense. The abdomen was hyperæsthetic. The skin along the inner side of the thighs and anterior and outer side of the legs was anæsthetic, but a very deep puncture (half an inch) was felt. There was an entire loss of reflexes, including the cutaneous of the sole and palm. The blood was hydræmic, aplastic, and presented variously sized and shaped corpuscles, but no parasites were observed. (See Chart I.)

CASE V.—Seh Mohammed; has been sick for two weeks. On admission his tongue was seen to be covered with small necrotic patches; the intervening areas were very red, beefy, and deeply fissured. He had a soft mitral systolic murmur and complained of much pain over the heart. After a few days' rest in bed, this patient was re-examined and found to have considerable palpitation, shortness of breath, and a blowing systolic murmur most distinct over the third left intercostal space, also a faint diastolic murmur most distinct in the left fifth intercostal space.

On November 16th, when again examined, the heart was acting rhythmically, and presented a murmur heard most distinctly during the ventricular diastole and over the ensiform appendix. Since November 27th all cardiac murmurs have disappeared. There is some epigastric tenderness, great soreness of muscles, and rapid emaciation. He shows slight œdema of the legs and over the sternum. There is some enlargement of the spleen and an antecedent history of malarial disease. The superficial nerve disturbances in this case are curious. On admission I transfixed the lips with a sharp needle without producing any response. The

CHART II. (CASE V.)



lips and face were profoundly anæsthetic. Six days later exquisite hyperæsthesia developed in these regions. The patient could not tolerate the touch of a spoon to administer his medicine. The skin of the hands and feet is insensitive. This patient can flex the toes, but is obliged to extend them by the hand when ordered to straighten them out. His reflexes are diminished. His blood shows no special changes. The urinary examination was negative. (See Chart II.) Discharged December 2, 1893, apparently well.

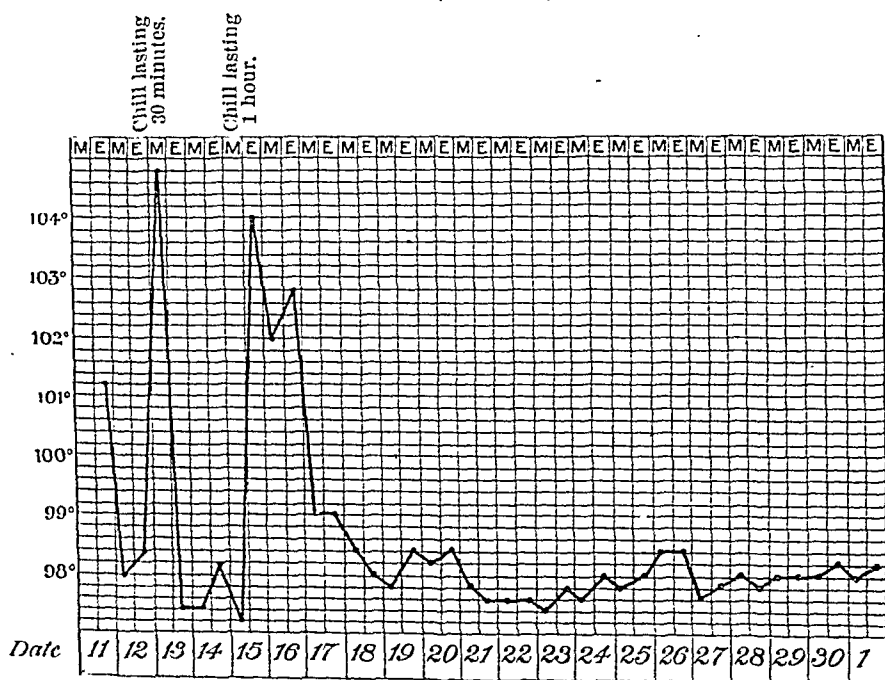
CASE VI.—Sala Abdul, aged twenty-five years, a strongly built man, has been sick for a week with pains in his muscles, palpitation, and sudden dropsy of the body. The skin over the trunk and the legs pits readily under pressure. He has a soft systolic murmur most distinct over the aortic cartilage. Has considerable diarrhœa, pain in the head, and aching in the muscles of the calves. He walks in a staggering manner. Has marked enlargement of the spleen, pronounced anæsthesia over the ex-

tremities. No antecedent history of malaria. Urine examination negative. The blood does not show any special changes and no crescents. Discharged November 20, 1893, convalescent.

CASE VII.—Mahmood Abdul, aged twenty-four years, has been sick for a month with muscle pains and diarrhœa. On admission was found to be very weak, the muscles of the legs markedly paretic and sore to the touch. There is no œdema, no enlargement of the spleen, a feebly acting dilated heart, and considerable dyspnœa. Patellar and cutaneous reflexes are absent. A soft murmur, most pronounced over the ensiform appendix, and coincident with cardiac diastole. There is a curious blending of anæsthetic and hyperæsthetic areas over the surface of the extremities. The urine shows neither albumin nor sugar. The blood shows no special change. Discharged November 20, 1893, convalescent.

CASE VIII.—Belali Saliman, aged twenty-seven years, has had difficulty in walking since about the middle of September. He is weak and emaciated. Has had chills and fever. His legs are slightly œdematous. Has a very distinct diastolic murmur, soft in character, best heard over the ensiform appendix; has a decidedly large spleen, and slightly enlarged liver. His urine contains a trace of albumin. He has marked abdominal

CHART III. (CASE VIII.)

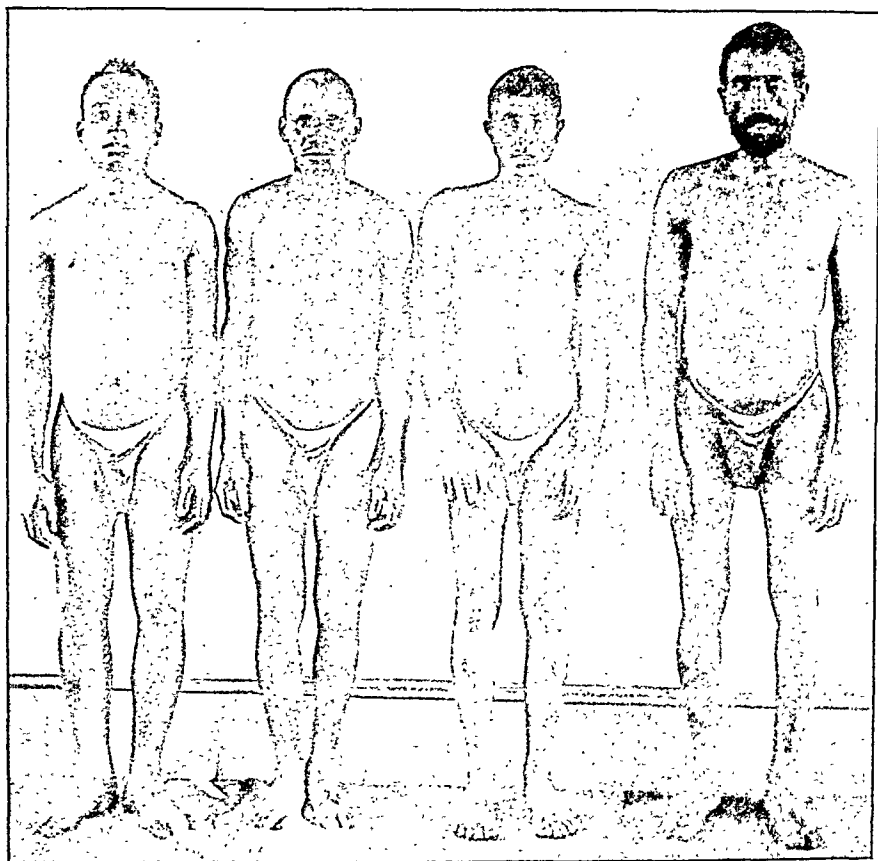


tenderness, nausea, and some vomiting. On the morning of November 13th he had a pronounced chill, which was repeated on November 15th. At the appearance of the first chill we began the free administration of quinine, the effect of which, however, did not become plainly manifested until November 15th or 16th. (See Chart III.) This man exhibited in his blood the hæmatozoon of malaria and also profound changes in the corpuscular elements. His nerve disturbances have been marked. He presented areas of anæsthesia over the extremities,

abdomen, and pectoral regions, interspersed with areas of hyperæsthesia. Nor did these remain constant, for the areas of insensibility became, after the lapse of twenty-four to thirty-six hours, hyperæsthetic.

Numerous trials with the battery were made in the cases and all showed, over affected muscles, changes in their electrical reactions.

I herewith present photographs of the patients, some of whom show the lesions of the disease plainly, and I also attach some of the temperature charts.



Saliman Ali.

Sad Bedad.

Abdulla Hamed.

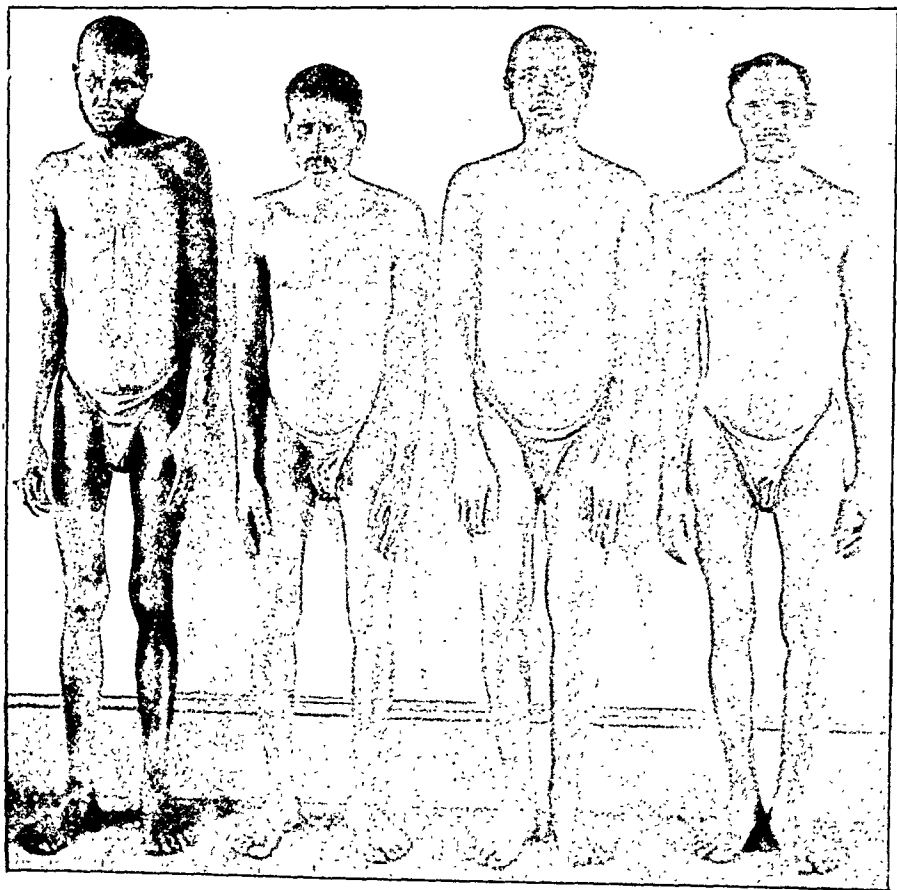
Mohammed Hafiz.

The treatment of all these cases was rest in bed between blankets, a full and sufficient diet, to which were added for each man two to three pints of milk per day. The medication consisted of the administration of strychnine, $\frac{1}{30}$ to $\frac{1}{60}$ grain three times a day; infusion of digitalis, $\frac{1}{2}$ ounce three times a day, and the free use of sulphate of magnesia. In Case VIII., owing to the intercurrent tertian intermittent, twenty grains of quinine daily were given, with marked effect on the malarial trouble.

This disease has very infrequently been observed, if ever at all, in

American ports; certainly no such opportunity for investigation and study as we have enjoyed has ever before been met in this country.

The questions which especially interest us as a quarantine body are to determine the probable cause of this disease and its degree of contagiousness. I believe that it is due to a special and specific poison, which produces a profound effect on the sympathetic, especially of the ganglia of the heart. Hence the cardiac disturbances, the nutritive changes, and the rapidly developed serous effusion. I believe the disease to be feebly



Belali Saliman.

Mahmood Abdul.

Sala Abdul.

Seh Mohammed.

contagious; of this we have had practical demonstration on the *Lanark*. The two men who died on board on the voyage from Java to Perim undoubtedly brought the disease aboard. The occupant of an adjoining bunk next took the disease, and thus it spread through the vessel's starboard forecabin from bunk to bunk—not in a rapid, but in a slowly progressive manner. Those who occupied the port forecabin escaped infection until near the end of the journey, when one or two became ill; but the firemen of the vessel, who occupied the starboard forecabin, constituted the larger number of those affected. A remarkable fact bearing

on the contagiousness of the disease is the infection of certain Arabs who came on board at Port Saïd. From all accounts, these people were in the best of health at the time they were shipped, but two of them, at least, were among those most profoundly affected with the disease. They were assigned bunks in the starboard forecabin. I would like to add a word about the heart murmurs. They had disappeared in the majority of cases at the time the convalescents left the hospital wards.

As these patients were almost all entirely ignorant of the English language, our study of them presented especial difficulties.

I wish to add that I was most ably assisted in my work in the study of this disease by Drs. Cleaver and Seymour. Dr. Howard S. Anders, of this city, made a series of very careful blood examinations of the patients, and Dr. Judson Daland also made investigations of the blood of Cases IV., V., and VIII. Both reports are of the greatest scientific interest and merit.

Report of Dr. Howard S. Anders on the Blood.

Two of the cases the blood of whom I examined were quite ill of the disease, occupying beds Nos. 4 and 8 (Cases IV. and VIII.) respectively; the third—the occupant of bed No. 7 (Case VII.)—was convalescent.

In the examination, attention was directed particularly to ascertaining the corpuscular richness of the blood, and with a view to discovering any microphytes in the fresh specimen.

At the outset it was remarked, after puncturing the finger-pulp, that the oozing blood (Cases IV. and VIII.) was peculiarly hydræmic in fluidity, though not so in color appearance; in other words, while its redness was fairly good, its plasticity was lacking out of all proportion, the blood from the moment of exit running unusually freely and rapidly in the cutaneous furrows.

The microscopic confirmation of this relatively increased blood diffuence was then observed in the apparent aplastic state of the red corpuscles. Instead of joining to form rouleaux, the disks, with few exceptions, tend to place themselves singly, or in groups of twos and threes here and there. This behavior was absent in the blood of the convalescing patient (Case VII.). A count of red corpuscles (Thoma-Zeiss apparatus—480 diameters) showed approximately 3,950,000 per cubic millimetre of blood in Case IV.; there were 4,400,000 red corpuscles per cubic millimetre in Case VIII. On account of the marked fluidity of the blood, I was not able to obtain more than requisite to form a solution of 1 part to 200 of the salt solution.

In Case VII. there was no corpuscular anæmia; the blood was about normal in plasticity, and a 1 per cent. solution was obtained with ease.

There was slight relative leucocytosis in the blood of Cases IV. and VIII. Very moderate hæmoglobinaemia was apparent.

Several micro- and megalocytes were noted in every field. A few poikilocytes were observed; also a point of interest was the finding of the plasmodium malarie in all three cases. This would seem to indicate a more or less constant prevalence of malarial miasmata in the places inhabited or visited by the sailors.

The hæmatozoa occurred in two forms: the spherical, clear hyaline bodies, and the crescentic bodies—both within the corpuscles. A very few crescents were found in the convalescent case. The transformed hæmoglobin melanin in those corpuscles containing the crescentic organisms assumed a slightly irregular black rod or bacillar appearance at the borders between the organisms and untransformed homogeneous-looking hæmoglobin.

Result of the Examination of the Blood of Three Cases of Beri-beri at the Quarantine Station, Essington, made by Dr. Judson Daland on November 27, 1893.

I. Seh Mohammed (Case V.), aged forty years. The color, consistence, and coagulability of the blood appeared normal as it exuded from the puncture. The red corpuscles were normal in size, but showed no microcytes, megalocytes, or poikilocytes. There was a moderate grade of leucocytosis, and the white corpuscles numbered 30,000 per cubic millimetre. Many of them were remarkable for their gigantic size, and contained large coarse granules, not unlike the eosinophile cells, and the large white corpuscles that are so frequently observed in leukæmia. Blood plaques were present in moderate numbers. Careful search was made for the plasmodium of malaria and other micro-organisms, but none was discovered. The Thoma-Zeiss hæmocytometer was employed in counting the red blood-cells, which numbered 4,750,000, and Fleischl's hæmometer gave 65 per cent. hæmoglobin.

II. Belali Saliman (Case VIII.), aged twenty-one years. The blood, as it exuded from the incision, seemed rather more liquid and paler than normal. Its coagulability was unchanged, but the red corpuscles were of great variety as regards size. A few were larger than normal, and many were only half the diameter of the normal cell. There were a moderate number of microcytes, but there was no tendency to poikilocytosis. There was a moderate grade of leucocytosis, and the white corpuscles numbered about 40,000. They, too, varied in shape, some being as small as microcytes, and many of them were coarsely granular, resembling eosinophile cells. The Thoma-Zeiss hæmocytometer showed that there were 4,400,000 red corpuscles per cubic millimetre, and a careful count of the microcytes showed that there were 400,000 per cubic millimetre. In counting the microcytes all red cells having a diameter of one-half, or less than the normal diameter for red blood-corpuscles, were counted as microcytes. Many of these were mere round points, but their true character was made clear by the color given them by the hæmoglobin present. Fleischl's hæmometer gave 60 per cent. of hæmoglobin. Careful search was made for the plasmodium of malaria, and for other micro-organisms, but none were observed.

III. Saliman Ali (Case IV.), aged twenty years. The blood from the puncture was normal in color, consistence, and coagulability. Microscopically the red blood-cells were normal in size and shape, with the exception of a few microcytes and an occasional megalocyte. To the naked eye the red blood-cells appeared normal in color, though Fleischl's hæmometer showed but 60 per cent. hæmoglobin. The white corpuscles were normal in size, number, and appearance. The Thoma-Zeiss hæmocytometer gives 4,575,000 red corpuscles per cubic millimetre. No plasmodium of malaria, nor other parasitic micro-organisms, were observed.

REMARKS.—It is to be observed in these blood examinations that two or three of the cases showed a moderate grade of leucocytosis, varying from 30,000 to 40,000, and that one of them showed a large number of gigantic leucocytes; two of them showed numerous white corpuscles containing large coarse granules. Case II. is also especially interesting from the extraordinary number of microcytes—that is, 400,000—many of which were remarkable for their minute size. Case III. shows a few microcytes and megalocytes. It is also interesting to note the want of proportion between the number of red corpuscle cells and the amount of hæmoglobin, resembling, in a slight degree, the results obtained in the examination of blood in cases of chlorosis. In each of the three cases the number of red blood-cells was slightly less than normal. This examination of the fresh living blood is also of interest from the absence of parasitic micro-organisms, though careful search was made in the hope of finding the plasmodium of malaria, or some like parasite, or some other form of low animal life. These microscopic examinations were conducted with the aid of the Zeiss microscope, using the apochromatic ocular No. 6, and the apochromatic oil-immersion objective $\frac{1}{12}$.

This incident was the sole unique and novel manifestation of the microscopic investigation, and the only feature carrying with it the suspicion of a possible etiological relation to this interesting endemic disease of Asiatic climes, beri-beri. Further than the above results there were no evidences of any blood parasites whatever.

On the morning of December 23d, in compliance with instructions received from the British Consul, Mr. Clipperton, the two patients detained at the Quarantine Station were delivered to the Medico-Chirurgical Hospital. As the question was raised at our last meeting by Dr. Lee, whether there was any possibility of the existence of trichinosis in these cases, a careful examination was made of the muscular fibres, with negative results. The fibres were, however, found to be granular. Examination of the blood of the patients by Dr. Dixon was likewise negative.

I have the pleasure to report that all of these cases made a good recovery, although the prognosis in at least two was very doubtful. A clinical fact of much interest was the disappearance of the symptoms and signs of the cardiac lesions. At the time of the discharge of the patients the heart in each case showed no evidence of the apparently serious lesions present during the course of the disease.

THE CULTIVATION OF THE TETANUS BACILLUS.

BY LANGDON FROTHINGHAM, M.D.V.,

ASSISTANT IN BACTERIOLOGY AND VETERINARY SCIENCE IN THE SHEFFIELD SCIENTIFIC SCHOOL,
YALE UNIVERSITY.

It is generally conceded that the tetanus bacillus is one of the most difficult organisms to cultivate; not because it is strictly anaërobic, nor because it does not readily develop upon the usual culture media, but rather, perhaps, because it is always associated with other organisms from which it is no easy matter to isolate it. The usual method of separating a given organism from a mixed culture, namely, the plate-culture method, is also recommended for obtaining pure cultures of the tetanus bacillus; but although it may be a simple matter to plate this organism, the writer has never succeeded, in spite of many attempts.

Kitasato's method ("Ueber den Tetanus Bacillus," *Zeit. für Hygiene*, Bd. vii.) of obtaining pure cultures of tetanus bacilli is as follows: The pus from the wound in cases of traumatic tetanus is spread over the surface of blood-serum or agar-agar, and the tubes are then placed in the thermostat at 37° C. Within twenty-four hours the organisms contained in the pus begin to develop, and microscopic examination reveals, among the other bacteria, a few tetanus bacilli containing end-spores. After forty-eight hours tetanus bacilli with spores are very numerous. Such a mixed culture is now placed in a water-bath, previously heated to 80° C., for three-quarters to one hour, which suffices to kill everything but the tetanus spores. Plate cultures are now made in special plating vessels, and these filled with hydrogen. In about ten days recognizable tetanus colonies have developed. Such colonies are described as resembling those of the bacillus subtilis; liquefaction occurs much slower, however, so that later this resemblance is lost. From these colonies pure cultures may be made by any of the anaërobic methods.

The method of Vaillard and Vincent consists in inoculating bouillon tubes with the pus, closing them from the air and keeping them at a temperature of 38° to 39° C. for from five to six days. These tubes, then containing many spore-bearing tetanus bacilli, besides other organisms, are heated for one or two minutes in a water-bath at 100° C., and plates or anaërobic cultures made. I have tried this method several times, but never with success; the spores seem to be always destroyed.

The first case of traumatic tetanus that I had the opportunity of examining bacteriologically was that of a dog¹ which died at the Royal

¹ It may be interesting to note here that the dog seems to possess almost complete natural immunity from tetanus. Müller observed only one case of general tetanus in fifty thousand sick dogs. In a like number Friedberger and Fröhner have never seen a case. Friedberger and Fröhner: *Pathologie und Therapie der Haustiere*, Bd. II. S. 636.

Dresden Veterinary School. A small puncture in one paw was the only wound to be found, and within this was an oat, which may have caused the wound or entered later. No pus being present, a platinum needle was rubbed about the inside of the wound, and the material thus obtained was spread over the surface of agar-agar tubes. Bouillon cultures were made with some of the same material, and the oat was rubbed over the surface of two oblique gelatin tubes. The bouillon and the agar tubes were placed in the thermostat, and the resulting mixed cultures were heated for three-quarters to one hour in a water-bath at 80°C ., and then plated. There being, however, no glass vessels such as Kitasato used, and no Petri dishes, the usual plate cultures were made, and these placed in an atmosphere of hydrogen. The plates in some instances remained sterile—more often foreign organisms developed, but never a tetanus colony. Like results were obtained later when Petri dishes were used.

About five weeks after the tubes were inoculated the original gelatin tubes were examined. They had been kept at the room temperature, were liquefied, and contained, besides many other organisms, many tetanus bacilli with end-spores. One of these tubes was heated to 80°C . for half an hour, and then, instead of plates, fresh bouillon cultures were made, and these placed under hydrogen at 37°C . After forty-eight hours there was an excellent growth, and a microscopic examination on the fifth day revealed seemingly pure cultures of the tetanus bacillus. Plates made from these cultures and placed under hydrogen were no more successful than the previous ones.

A white mouse was then inoculated subcutaneously with a loopful of the other original gelatin culture. The animal died of tetanus in three days, and from the more or less firm bed of pus at the point of inoculation bouillon cultures were made and placed in hydrogen at 37°C . After forty-eight hours these bouillon tubes contained various bacteria, but among them many spore-bearing tetanus rods. Upon heating these cultures in a water-bath at 80°C . for three-quarters of an hour, making fresh bouillon cultures from them and placing these in hydrogen at 37°C . for forty-eight hours, pure cultures of tetanus bacilli were again obtained.

From this experience the following method was determined by which pure cultures of the tetanus bacillus may be obtained from cases of traumatic tetanus without the use of the plate-culture method:

The pus of the wound is transferred to decidedly alkaline bouillon tubes. If no pus is present, scrapings from the internal surface of the wound, or small pieces of tissue snipped from the same region, are used.¹

¹ Tetanus bacilli are invariably found in the immediate vicinity of the wound or point of inoculation. In the organs their presence is exceedingly limited. Only once, when nearly the whole brain of a guinea-pig was employed in making cultures, did Vaillard and Vincent find the tetanus bacillus. Büdinger (Wien. klin. Wochenschr., 1893) claims that they are also

The tubes thus inoculated may be placed at once in the thermostat (36° to 39° C.), or first in a chamber which is filled with hydrogen, and then chamber and all is transferred to the oven.¹ It is also a good plan to inoculate one or two mice with like material, that there may be something to fall back upon in case the cultures should fail. After twenty-four hours the bouillon has become cloudy and a slight sediment rests at the bottom of the tubes; after forty-eight hours both cloudiness and sediment have increased. The cultures may now be taken from the thermostat and examined. Upon opening the hydrogen chamber one notices the peculiar and foul odor produced by the growing tetanus bacilli. Microscopic examination of the cultures reveals bacteria of nearly every form, but, as a rule, there are many spore-bearing tetanus bacilli among them, easily recognizable by their peculiar drumstick shape.²

If these organisms are present the tubes are placed in a water-bath already heated to 80° C., and kept at this temperature for three-quarters of an hour. As a rule, this is sufficient to kill all organism contained in the cultures except the tetanus spores.³

From these heated tubes one may, often with good results, inoculate at once some solid anaërobic culture medium; but since the development in bouillon is so rapid and luxuriant I prefer to inoculate fresh bouillon tubes at once. These tubes are then placed in the thermostat under hydrogen. After twenty-four hours the same cloudiness and sediment are observed, perhaps not so well marked as in the first instance, and the same disgusting odor. The bouillon soon begins to clear from above, and in a week or ten days is quite cloudless, the culture having sunk to the bottom, where it rests as a white sediment which becomes darker with age. These cultures are generally pure (a mixed culture usually

present in the lymphatic glands, but Schnitzler ("Zur Kenntnis des Tetanus," Centralbl. für Bakt. u. Parasit., Bd. xlii. S. 679) says this is only when there is mixed infection. According to Sanfelice (Zeitschr. für Hygiene u. Infektionskrankheiten, Bd. xiv. S. 357), tetanus bacilli may be demonstrated microscopically at the point of inoculation, but many preparations must be made before finding one bacillus, and they very seldom contain spores.

¹ Experience convinces me that in tubes well filled with bouillon (half-full or more) tetanus bacilli develop readily, whether in the presence of hydrogen or not, provided *other organisms* are also present. If only tetanus bacilli are present the growth is uncertain except under hydrogen. This was recently emphasized: Well-filled bouillon tubes were inoculated with tetanus bacilli, and, as usual, placed in the oven in an atmosphere of hydrogen. After two days no growth was visible, and an examination revealed a leak in the hydrogen chamber. This was remedied, again filled with hydrogen, and returned to the thermostat. After forty-eight hours there was a luxuriant growth in the same tubes.

² One must remember that drumstick bacilli found in such a preparation are not *necessarily* tetanus bacilli, for there are several other similar forms which may be found in such cultures, perhaps especially in those made from experiment animals inoculated with garden earth. The spore of the tetanus bacillus is *round* and much larger than the rather slender rod in which it rests.

³ Kitasato says that the spores of other anaërobic bacteria found in tetanus pus are killed by this temperature in half an hour. One is occasionally troubled with other bacteria, however, sometimes with a bacillus bearing end-spores, and I was once unable to get rid of a coccus that withstood this heat for an hour.

but not always remains cloudy), but it is wise to prove their purity by inoculating agar, gelatin, etc. Although the entire culture has settled to the bottom, the bacilli are still motile, sometimes moving quite rapidly. In a bouillon culture two months old a sluggish motion was still visible, but in a very virulent culture ten months old I was unable to convince myself of actual motion.

This method has been successfully used many times by me, not only to obtain pure cultures of tetanus from experiment animals, but also from the two following cases of tetanus traumaticus.

The first case was that of a horse. The foot was brought to the laboratory, and after paring away the horn in the region of the nail thrust, small bits of tissue (there being no pus) were snipped out and transferred to bouillon. In this case two mice were also inoculated with similar bits of tissue which were introduced beneath the skin of the back just above the root of the tail. These mice died of tetanus, one in three and the other in five days, and from them, as well as from the foot, pure cultures of tetanus were obtained in the above-mentioned manner.

Recently, through the courtesy of the New Haven Hospital, I had an opportunity to obtain cultures from a fatal case of traumatic tetanus in a man. Marked spasms and trismus were just beginning. A platinum loop was inserted into the wound (situated at the back of the head) and with the material thus obtained bouillon cultures were made. By the same method of procedure pure cultures resulted.

I think this method may safely be recommended, especially if one has not some such vessels as were used by Kitasato at hand. It is quicker and simpler than the two methods referred to. Pure cultures may be obtained in four days, while by the other methods it takes at least ten, since colonies are not recognizable upon the plate before a week. It is, moreover, a surer method, for I must believe that it is no simple matter to obtain plate cultures of the tetanus bacillus. Furthermore, since mixed cultures must always be examined to ascertain the presence or absence of tetanus bacilli before further procedure, it is evident that a cover-glass preparation from an impure bouillon culture will show almost at a glance all the different organisms it contains, while it is equally true that this would not be the case if the preparation were made from an impure agar or serum culture, although a preparation from the water of condensation would give this result to a certain extent. Finally, the tetanus bacillus develops much more rapidly in bouillon than in agar or serum, so that after heating we have more bacilli to work with. In bouillon also we have a medium every part of which is more evenly and surely penetrated by the heat, and more easily manipulated.

In spite of the fact that it is not in accord with bacteriological methods to call anything a *pure culture* that is not derived from an

isolated colony, I must consider these cultures perfectly pure: First, because upon microscopic examination nothing but tetanus bacilli and spores are found. True the purity of such a preparation might be questioned, since it contains rods with and without spores, free spores, and spores re-developing into rods, besides numerous threads of various lengths—indeed, often of different sizes. These, however, are only different forms of the tetanus bacillus. Secondly, if mice are inoculated with such bouillon cultures they die of tetanus in from twelve hours to five days, and there is absolutely no change to be seen at the point of inoculation, or at most only slight hyperæmia. On the contrary, if an impure culture is inoculated, swelling, inflammation, pus, etc., are invariably present at the inoculation point. Thirdly, if material from such cultures is transferred to tubes containing agar, gelatin, etc., these tubes remain perfectly sterile. Finally, if from such a bouillon culture anaërobic cultures are made in gelatin containing grape sugar or any other reducing media, only the tetanus bacillus develops with its characteristic growth.

A few of the simpler anaërobic methods are as follows:

Gelatin. The tubes should be well filled with this medium, or the usual amount may be used, and after inoculation an equal quantity of melted gelatin poured upon it.

Gelatin with 2 per cent. grape sugar. In this medium the tetanus bacillus develops well as a rule. About the fourth day a cloudy, burr-like growth appears toward the centre of the gelatin. Soon numerous small gas-bubbles form, gradually pushing up the gelatin. The same vile odor is observed, and about the tenth day liquefaction begins. As this becomes complete the culture, containing mostly rods and threads, sinks to the bottom as a white mass. The growth is about the same in gelatin without sugar. According to Vaillard and Vincent, young gelatin cultures, *e. g.*, five to seven days old, are almost innocuous; a guinea-pig may receive with impunity one-fifth to one-half c.c. of such a culture. Gelatin cultures over ten days old, on the contrary, are very virulent.

An exceedingly good anaërobic method is as follows:

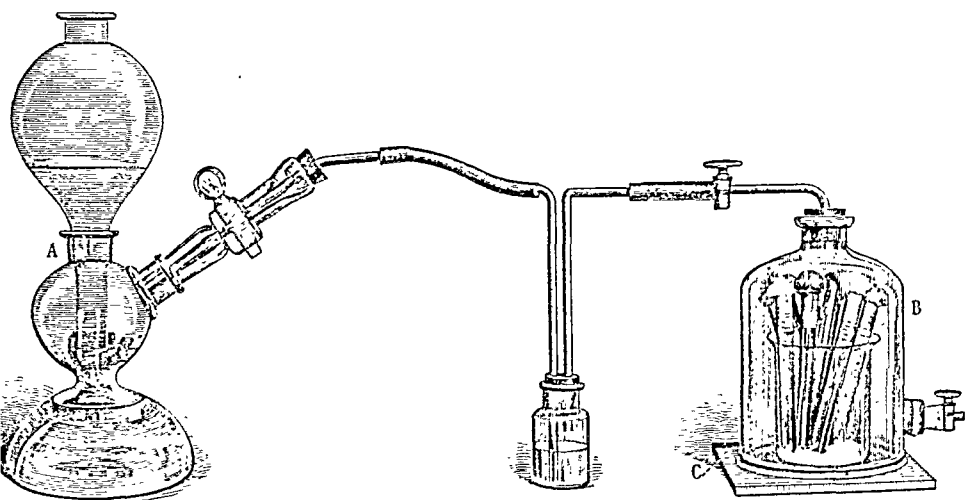
About 10 c.c. of *agar-agar gelatin* (agar, $\frac{1}{8}$ per cent.; gelatin, 5 per cent.) is placed in each tube. This medium has the advantage of being as clear as gelatin and may remain in the thermostat without liquefying. Having inoculated a tube of this medium with the desired anaërobic organism, the cotton plug is cut off at the top and pushed into the tube till it nearly touches the surface of the medium. A second plug is then inserted into the tube till it nearly touches the original plug. This second plug is then saturated with pyrogallic acid solution,¹ and finally

¹ Pyrogallic acid, 1 gramme; 10 per cent. caustic potash solution, 10 c.c.

a third plug is fitted into the mouth of the tube and covered with paraffin.

Agar-agar may be used in any of the ways spoken of, or *agar-agar* with 5 per cent. formic acid; but owing to its usual cloudiness it is not as satisfactory as a clear medium. Oblique *agar* has been recommended for growing anaërobic organisms. After inoculation the cotton plug is removed, the tube filled with hydrogen and again plugged, but with a rubber stopper smeared with paraffin.

According to Sanfelice (*Zeitschr. für Hygiene u. Infektionskrankheiten*, Bd. xiv. S. 346), it is unnecessary to use a reducing agent, and only a small amount (5 c.c.) of the culture medium need be placed in each tube, if the medium is taken directly from the sterilizer and hardened as quickly as possible. The heat expels all the oxygen from the medium, and, cooling it quickly, shuts it out. It gradually enters again, but not for several days, and before this time most anaërobic organisms have had time to develop, especially toward the bottom. He thinks that many failures to grow anaërobic organisms in media without the use of reducing agents may be referred to the fact that the media has been exposed to the air for a long time.



A. Hydrogen generator. B. Hydrogen chamber. C. Ground-glass plate.

Perhaps a few words regarding a hydrogen chamber may not be out of place. A simple chamber consists of a bell jar with an opening at the top and another near the bottom, for the entrance and exit of the hydrogen. Rubber stoppers, through which run glass tubes supplied with stopcocks, fit tightly into these openings. The jar is placed in a dish containing a sufficient amount of liquid paraffin or mercury, and filled with hydrogen. The writer uses at present such a bell jar fitting tightly to a glass plate, the contact surfaces being ground. (See figure.) Such a

chamber is perfectly air-tight, especially if a little vaseline is placed between the two surfaces.

In conclusion, the method described above seems to me practicable and simpler than methods hitherto described. The organism is at best a most troublesome one to work with, and simple as this method sounds, the experimenter may find that many attempts must be made before successful results are obtained. Of four or five bouillon tubes, for instance, inoculated with tetanus-wound material, perhaps only one will give pure cultures after heating, perhaps none; in some cases again, all. It is therefore always advisable to also inoculate mice, that one may have fresh material in case the first attempts fail. Why would it not be possible with this method, together with the inoculation of experiment animals, to make an early diagnosis in cases of suspected tetanus traumaticus, if anything is to be gained thereby?

To obtain pure cultures, then, of the tetanus bacillus from cases of traumatic tetanus, or experiment animals, the following method is recommended:

1. Inoculate alkaline bouillon with the pus from the wound, or, pus being absent, small bits of tissue from the inside of the wound, or in experiment animals inoculated with pure cultures, bits of tissue from the region of the point of inoculation are used.

2. Place tubes in an atmosphere of hydrogen and in the breeding-oven for forty-eight hours.

3. Examine microscopically, and if tetanus bacilli are present—

4. Heat from three-quarters of an hour to an hour in water-bath previously heated to 80° C.

5. From heated tubes inoculate fresh bouillon, and place in thermostat under hydrogen for forty-eight hours.

6. Test purity by microscopic examination and cultures in gelatin, agar, etc.

7. Test virulence on mice, white or gray.

REVIEWS.

A PRACTICAL TREATISE ON DISEASES OF THE SKIN, FOR THE USE OF STUDENTS AND PRACTITIONERS. By JAMES NEVINS HYDE, A.M., M.D., Professor of Skin and Venereal Diseases in the Rush Medical College, etc. Third edition, thoroughly revised and enlarged. 8vo., pp. xx., 802. Philadelphia: Lea Brothers & Co., 1893.

THE rapidity with which new books and new editions of standard works on dermatology have appeared during the last decade is significant of the strong and steadily increasing interest in this department of medicine. Twenty-five years ago when the only books accessible to the average student were the involved and intricate tomes of Erasmus Wilson, or one or two translations from the French with their metaphysical abstractions of herpetism and the darts diathesis, it was no wonder that the study of cutaneous diseases possessed few attractions. Even the excellent text-book of Tilbury Fox, that appeared at about that time, was better adapted to the specialist than to the student.

It was not, however, until the publication of good translations from the Vienna school, and the return to this country of many young and enthusiastic disciples of Hebra, that the study of skin diseases took on the scientific precision that has since characterized it.

In due course of time there came into the hands of the profession a number of excellent treatises written in America, such as the unusually able works of Duhring, Piffard, G. H. Fox, Robinson, and others.

As might be expected, these works showed the influence of European teaching—but by no means altogether German in character—still they possessed a degree of originality and freedom from that swearing in the words of the masters that is the bane of all independent research.

That we have not a distinctly American school of dermatology is due to the essentially eclectic attitude of the American mind. If, as Matthew Arnold said, we lack a perspective to make us interesting, we are also free from the prejudices of one, and perhaps while losing in interest we gain in intellectual freedom.

Even the Europeans are beginning to appreciate the real advantages of this attitude: the Germans admire Hebra and admit his rare distinction as a great teacher, but they no longer follow him blindly; the French have at last escaped from their doctrinaires; and in England a new spirit of solid and conscientious work is the demand of the hour in dermatology.

The work before us has suggested, and in many ways illustrates, what has just been written. Dr. Hyde, if we are not misinformed, was one of the small band of men who took up the practice of dermatology twenty-three or four years ago, and by hard work in the clinics, in the lecture-room, and in the columns of the medical press, taught the profession to understand its importance as a special branch of medicine.

The first edition of this text-book, dedicated then as now to Professor Kaposi, showed very plainly the influence of Vienna, and although well received at the time, for it was a meritorious attempt, it lacked the personal element, the sort of genial dogmatism that comes from long experience and familiarity with the subject. The second edition was a decided advance in every direction. The edition just issued from the press, the third, exhibits the author in the maturity of his experience both as a teacher and student, and fully represents the science and art of dermatology as it exists to-day.

The general scope and especial features of this work have already received sufficient notice in this Journal, and it only remains for us to point out the additions that have been made to this edition.

An examination of the text shows that the author's statement in regard to emendations and improvements is perfectly correct. Five new plates and thirty-two new woodcuts have been introduced. They are all good, and the process plates are more satisfactory than is usual in such illustrations.

Thirty-five diseases hitherto undescribed by the author find a place in this edition, and receive such treatment as their relative importance would seem to justify. Among the more important of these may be mentioned pityriasis rubra pilaris, keratosis follicularis, the psorospermic nature of which is denied, xanthoma diabeticorum, pemphigus vegetans, actinomycosis, and leucokeratosis buccalis.

A number of minor affections and various tropical disorders also receive brief but adequate notice.

Perhaps the most valuable chapters in the book are those relating to Tuberculosis of the Skin, in which process are included lupus vulgaris, with its manifold clinical expressions, the scrofulodermata and the various types of skin lesion in which tubercle bacilli have been demonstrated.

According to Dr. Hyde, some of the disorders of the scalp called "epilating," "cicatricial," "follicular," and other unnamed forms of alopecia, are in all probability tubercular in character.

We are quite in agreement with him in believing that a large number of so-called acneiform and other ulcerative and cicatricial disorders of the skin will yet find their pathological explanation in the tubercle bacillus.

The section devoted to Eczema is well handled, although in our judgment the therapeutic indications lack somewhat in that degree of precision necessary to the student and young physician. Ichthyol is not so highly lauded as would seem to be the fashion at the present time. The author very properly protests against the multiplication of unmeaning and fantastic terms in cutaneous nomenclature, and says that such words as "eczema seborrhoicum," "lichen psoriasis," and the like, should be eschewed.

Without taking up page after page and chapter after chapter, it would be impossible to convey an adequate impression of the immense amount of labor and research that has been expended upon this treatise; and, indeed, such a course would be, after all, tantamount to a complete exposition of modern dermatology; for such in effect is the result presented to the inquiring student. It would be an ungracious task, where so much is praiseworthy, to point out the comparatively few sins of omission and commission that may be noted here and there. Taken all in

all, Dr. Hyde's book may be heartily commended to the student and practitioner alike as one of the best exponents of the subject now before the profession. As is usual with the eminent house whose imprint is on the title-page, the typographical execution is all that could be desired.

W. A. H.

PYOGENIC INFECTIVE DISEASES OF THE BRAIN AND SPINAL CORD:
MENINGITIS; ABSCESS OF BRAIN; INFECTIVE SINUS THROMBOSIS.
By WILLIAM MACEWEN, M.D., Glasgow. New York: Macmillan & Co.,
1893.

It would be difficult to find a better example of the progress which surgery has made during the past decade than in the contrast between the sombre views which in 1883 Professor Macewen says he was inclined to take as to the prospects of recovery from operations for cerebral abscess and his present statement that he "now regards an uncomplicated cerebral abscess, early recognized, accurately localized, and promptly operated on, as one of the most satisfactory of all intra-cranial lesions, the patient being at once relieved from a perilous condition, and usually restored to sound health." While the outlook for cure of the more serious lesions of infective meningitis and sinus thrombosis is not yet nearly so good, he sees reason to hope that as our knowledge of them increases, the results of surgical treatment will correspondingly improve.

Like most of the author's published work, the volume is based largely on personal experience. An introductory chapter on the temporal bone and the cerebral sinuses and membranes sets forth their surgical anatomy with great detail and with equal clearness as to their relation to the course and symptoms of pyogenic diseases. Attention is called to the elaborate arrangement which exists to prevent the intra-cranial venous system from being subjected to the aspiratory action of the chest movements in inspiration. Every surgeon has seen, during operations on the neck, when the carotid sheath has been opened, the remarkable variation in size which occurs in the internal jugular vein, collapsed and flattened during inspiration, turgid and tense when expiratory movements are made. If the venous sinuses were affected by deep breathing to the same extent as the internal jugular it is evident that a condition approaching unconsciousness would often result from the momentary cerebral anæmia. As a matter of fact, rapid, forcible breathing does produce this condition to an extent which has enabled minor surgical procedures, like the opening of an abscess, to be done without pain to the patient. The explanation which is given of the mechanism by which such anæmia is prevented from occurring ordinarily is an excellent example of the thoroughness and fulness with which the anatomico-physiological side of the subject is treated.

In the chapter on Pathology, abscess and infective meningitis are considered together, as whether the one or the other results from a given extra-cranial source of infection depends chiefly, or entirely, upon the anatomical relations of the structures and the intensity of the inflammation caused by the micro-organism. The various infective intra-cranial lesions may, therefore, be classified as follows: 1. Inflammatory process slow, mild, distinctly localized, and involving a portion of the inner

table—external pachymeningitis or extra-dural abscess. 2. If this condition persists, adhesions of the arachnoid and pia take place and shut off the general subdural cavity just as general pleurisy is prevented from following abscess of the lung by adhesions of the visceral and parietal pleura, and as the abscess of appendicitis is walled off from the cavity of the peritoneum. 3. Further persistence may be followed by softening. If the pia remains intact a subdural abscess forms; should it give way cerebral ulceration or abscess follows; should the wall of the abscess break down lepto-meningitis results. 4. The latter condition occurs if the micro-organism penetrates rapidly to the inner layer of the dura before much exudate has formed.

Other sources of infection and various forms of disease are considered: punctured wounds of the cranium; punctured fractures; infective injury to the skull without fracture; pathogenic affections of the face and scalp, etc. But the author's experience shows, as does that of the profession, that "It is in the tympanum and antrum that the majority of the pathogenic processes are generated which afterward spread intracranially and affect the brain and its membranes." And it is also true that it is especially the *chronic* affections of the middle ear that lead to this result.

The various terminations of cerebral abscess are exhaustively considered—absorption, encapsulation, spontaneous external evacuation, leakage into the subdural space or into the ventricles, etc. It is noted that Gruber's interesting case shows that an abscess can form as a result of otitis media and remain *in situ* while the ear disease disappears. This is, however, rightly said to be of great rarity.

The symptoms of abscess are divided into those characteristic of three stages: 1. Initiatory; 2. Full development of abscess; 3. Various terminations. The *first* includes otorrhœa, ear pain, vomiting, rigors, slight fever, diminution of discharge of pus from the ear; duration from twelve to seventy-two hours, or even to a week.

The *second* embraces lessening of pain, tenderness on mastoid percussion, slow cerebration, want of sustained attention, mental obscuration, gradual diminution of ability to apply strength, temperature normal or subnormal, pulse slow and full, respirations slow, constipation, anorexia. Vomiting, rigors, and convulsions are rare. Paralysis is not infrequent. Optic neuritis is common during the later stages. Localizing symptoms are rare because in the majority of instances the abscess is outside the motor area.

The *third*, or terminal stage, may be marked by stupor and coma; or, if acute lepto-meningitis follows, by "vomiting, restlessness, temporary squinting, flushing and erratic rigidity of the limbs, clonic spasms, trepidation, and prostration, the pulse meanwhile becoming quick, the breathing hurried, and the temperature high."

As to prognosis, the author states that while the great majority of cases not dealt with surgically end in death within a short period, generally a few weeks, on the other hand there is no cerebral affection more amenable to surgical treatment, and none which offers better results. An uncomplicated cerebral abscess whose position is clearly localized, if surgical measures are adopted for its relief at a sufficiently early period, is one of the most hopeful of all cerebral affections.

The prophylactic treatment of all the pyogenic diseases (the remainder of which space will not permit us to discuss) is obvious. As abscess in

the brain, infective thrombosis of the intra-cranial sinuses, and leptomeningitis originate in primary infective foci; the first step in prophylaxis is to prevent the occurrence of such foci, the second to eradicate them when present. The methods of doing this are fully and clearly described.

The operative treatment of these affections is also given in detail and with the author's characteristic attention to the minutiae, which here, if ever, are essential to surgical success.

The concluding chapter, on "Results," gives, among other statistics, the records of 94 cases of infective intra-cranial lesions, with 74 operations, 63 deaths, and 31 recoveries. It is interesting to note that of the 25 abscesses of the brain included in that table, 19 were operated on and 18 recovered.

Everything that Professor Macewen writes is certain to be of interest to the profession, and his habit of waiting for time and experience to elucidate his theories and demonstrate the soundness of his methods has rendered this last contribution to brain surgery as noteworthy as the brilliant and original articles in the same direction which he has previously published.

It is rare to find a book written on such a high scientific plane which is at the same time so practical and helpful, and it is a pleasure to commend it not only to surgeons but to the profession at large.

J. W. W.

A PRACTICAL TREATISE ON MATERIA MEDICA AND THERAPEUTICS. By ROBERTS BARTHOLOW, M.A., M.D., LL.D., Professor of Materia Medica, General Therapeutics, and Hygiene in the Jefferson Medical College of Philadelphia; Fellow of the College of Physicians, etc. Eighth edition, revised and enlarged. Pp. xxvii., 820. New York: D. Appleton & Co., 1893.

WHEN a treatise has reached its eighth edition, it might seem that criticism is superfluous, that the work has already demonstrated that it found a place and has filled it. The revision of the United States Pharmacopœia brings with its appearance the necessity of re-writing the Materia Medica; the ever-advancing science of Therapeutics demands that new theories and new remedies shall have a place, and that the obsolete shall be expunged. As we read the pages so familiar to us since when a student we read an earlier edition, we note the many additions, but we recognize much that might have been omitted. Some drugs which are old, but yet not in general use, as trichlorphenol, thallin, and trimethylamine; others more recent, as chloralose, formanilide, need more extensive clinical investigation before they should have a place in a text-book. Of the newer remedies we are pleased to find that the author has not been made unduly enthusiastic by the current literature concerning the organic extracts, and we commend his fairness of statement. Hypodermatoclysis also receives just appreciation. As in the earlier editions the author very properly adheres to the use of *hypodermatic* in place of *hypodermic*, although we notice *albumen*, p. 177, for *albumin*. We note several misprints of proper names, as Histon Fagge, p. 25; Stockler, p. 394; C. Vaughan, p. 59; Heuchard, p. 250;

while the same author appears as Mosetig, p. 259, and Von Mosetig-Moorhof, p. 261. Nor are we inclined to believe that an issue of a medical journal of 1883 is a recent one, p. 30. On p. 122 we find practically the same statement as to cod-liver oil with ether repeated. We do not note many important omissions, yet, p. 13, wafers are sometimes made of starch, and bougie is more frequently used than suppository when a drug is intended to be inserted into the urethra or nasal fossæ, and gelatin is an eligible vehicle; p. 278, mercury can be administered hypodermatically, as Lang's *oleum cinereum*; p. 155, several recent bismuth preparations, of which the subgallate is an example, are in extensive use; p. 264, aristol, which is probably quite as valuable as iodol; p. 293, copper arsenite, and, p. 360, guaiacol have attracted considerable attention; p. 385, lysol in many instances can advantageously replace creolin; p. 396, methacetin may supplant phenacetin; p. 696, naregamia appears to be important as a substitute for the ordinary ipecacuanha, and camphoric acid has been strongly recommended in the sweating of tuberculosis; p. 42, matzoon is considerably more popular than kefir. We believe that Smith's experiments justify the belief that it is the acid of the iron preparation which injures the teeth, p. 141; and that the alkalinity of the hypophosphites is the cause of digestive disturbance, which may be corrected by dilute phosphoric acid, p. 135; that sarsaparilla, when administered with the corrosive mercuric chloride, may give rise to poisonous symptoms from its absorption from the ulcerations caused by the latter, p. 335; that local applications of salicylic acid in rheumatism should be considered, p. 376; that bromoform taken internally has given rise to dangerous symptoms, p. 619; that magnesium sulphate as a cathartic can be effectual when administered hypodermatically, p. 707. In the generally enthusiastic view of the efficacy of drugs we are surprised to find considerable skepticism as to the value of the hypophosphites, p. 135; hydrogen dioxide, p. 349; and if the large experience of Sommerbrodt and of Von Brunn and the patient work of Robinson are of any value, creosote, p. 360, should have received more attention. We believe that codeine, p. 604, has a much larger field of usefulness, and that in many instances it can advantageously replace morphine. The index hardly gives an idea of the contents of the book, nor is it an easy method of looking up a subject. There are a few instances of error, as, asaprol is found on p. 394, not on p. 732. The clinical index is rather more than a series of therapeutical suggestions, but it should be used only with the careful study of the references there contained.

We have found great satisfaction in reading this last edition. That a student should be graduated possessing the firm confidence of the author that certain remedies are potent in combating morbid conditions would lead only to bitter disappointment. That it is rather a book for suggestion to the practising physician that others have found these drugs useful as remedies, and that his previous experience shall aid him in weighing the various statements is, we believe, true. For a student the sound basis of therapeutical theory is physiological experiment; if he cannot master this he is not likely to become a brilliant therapist. For an inexperienced graduate to attempt to apply the teaching of a treatise on therapeutics based upon empiricism, when he does not possess the wide information, the careful reasoning, and the general skill which have made the fame of the author, is to invite failure. That this is

one of the best works written from the standpoint of clinical observation we are firmly convinced, and we write remembering the many years during which this book has been constantly in use. R. W. W.

HOLDEN'S MANUAL OF THE DISSECTION OF THE HUMAN BODY. Edited by A. HEWSON, A.M., M.D. 12mo., pp. 803. Philadelphia: P. Blakiston, Son & Co., 1894.

THE last, the sixth, edition of *Holden's Anatomy*, which has recently appeared, takes high rank among dissecting manuals. It is peculiarly well fitted for the dissecting-room and for the student's study of regional anatomy. The illustrations are numerous, accurate, and well chosen; the text is clear and sufficiently full. The text might be criticised for the retention, here and there, of bits of nomenclature which should be regarded as obsolete—such as the terms Heys' and Burns' ligaments, the horny band of Tarinus, testes muliebres, etc.

The text and illustrations are well arranged. The book fills the place for which it is built as well, if not better, than any other text-book of its class, and is to be regarded as standard. Instructors of anatomy should more generally insist upon the employment of such a dissector by their students.

In the study of anatomy the study of the regions as usually carried out in the dissecting-room is the method productive of the best and most practical results. It appears to the student more difficult than the study of systematic anatomy, and it is more difficult for the beginner.

The study of regional anatomy becomes much easier and much more profitable to the student who has already mastered the "systems," osteology, myology, etc. In our American schools where anatomy is studied for two years, the manner of dividing the subject differs greatly. In some schools the entire subject is covered in each year. In others osteology, arthrology, and myology are studied the first year, the remainder of the subject the second. Still other divisions are adopted. The most satisfactory division seems to be: First year—Systematic anatomy, the study of the systems, bones, joints, muscles, vessels, nerves. Second year—Regional anatomy, with special emphasis on brain and cord, thoracic and abdominal viscera, genito-urinary organs, and organs of sense. In the second year the practical and clinical points can best be brought to the student's attention.

In addition to didactic lectures and dissecting-room work the anatomical class should be divided into small sections of not more than forty men, each section reciting to an instructor lessons which have been assigned in a text-book. This method makes it necessary for each student to possess two text-books on anatomy—one a systematic text-book, such as Gray, Quain, or Morris, to be used as a text-book for first-year work and for reference; the other a manual of dissection, a regional anatomy to be used in the dissecting-room and during the greater part of the second year.

Holden's Anatomy and works of its class are not to be recommended to displace in the student's library systematic text-books on anatomy, but are to be strongly recommended for the dissecting-room and as a text-book for such second-year work as above outlined. A. D. B.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE
MEDICAL SCHOOL AND HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

THE SUCCESSFUL MANAGEMENT OF INEBRIETY WITHOUT SECRECY IN THERAPEUTICS.

DR. C. H. HUGHES believes that inebriety is a disease which can be successfully treated; the unfortunate victim of alcohol is to be cured and then reformed, through the seeking of medical relief. The trouble in the past has been the failure to seek, by suitable changes of environment and proper medical treatment, that renovation and rebuilding of the damaged organism which makes resistance to alcoholic enslavement a possibility, in the organism of the average habitual or periodic inebriate. The first essential to the cure of inebriety is the substitution of a less harmful support than alcohol to the shattered brain, nerves, and damaged vital organs: in order of preference, morphine, strychnine, quinine, cinchona, valerian, coca, ammonium bromide. The second is water, plenty of it, or its equivalent, milk. The tissues, the blood, the emunctories and the skin must have it. The third is rest, a new and proper environment; and subsidiary are the chemical restraints therapeutics may place on over-acting nerve cells: chloral, sulphonal, bromides, vegetable narcotics, valerianates, opiates, cephalic galvanization, soothing music, the bath. The fourth is the removal of the débris of the last and previous drunks; here saline laxative waters without stint is the remedy *par excellence*. The effervescent saline which clears out the alimentary canal tranquilizes the brain at the same time, although mercurials are not amiss. The fifth is the reconstruction of the undoubtedly damaged cerebro-spinal centre, and the several affected organs of vegetative life. This begins with rest and sleep and food, the phosphates, the hypophosphites, the hæmatics, milk, beef-tea, capsicum. Sixth is destruction of the drink-craving, which must be done upon physiological principles; train the victim's own inhibitions, first by suggestion, secondly by moderate indulgence properly treated. Spiritus frumenti, ʒij, cum vino antimonio, ʒj, can be repeated *ad libitum*, or

apomorphine with aurum bichloride for psychical effect. After confidence in his strength has returned to the patient, he must be warned to never again have confidence in his power of resistance with alcohol in his blood. The cure of the drink habit is not always perpetual; it is not everlasting without the aid of the patient himself.—*The Alienist and Neurologist*, January, 1894.

THE DENUTRITIVE ACTION OF DUBOISINE.

DR E. MARANDON DE MONTYEL has found that the marvellous sedative effects which follow the administration of this remedy are almost always associated with a very disturbing failure of nutrition. Of twenty-five cases, eighteen lost weight, even in the absence of all gastric symptoms, a simple diminution of appetite not being excluded. This failure of nutrition seems to be entirely independent of any influence which it may exert upon the alimentary canal. The four inconveniences of this drug are: 1, an acquired tolerance; 2, gastro-intestinal disturbance; 3, cardiac enfeeblement; 4, denutrition. By interrupting the treatment the first difficulty is overcome. By injecting the remedy immediately after meals, the second is avoided. In persons suffering from cardiac disease duboisine should be proscribed, and this constitutes the only actual contra-indication, for the denutritive influence can be considerably reduced by attention to diet, use of tonics, especially if the treatment is not of long duration.—*Bulletin général de Thérapeutique*, 1894, 8e liv., p. 145.

HYPODERMATIC INJECTIONS OF BLOOD.

DR. BLOCH reports a case of a single patient under whose skin he injected at two different times three drachms of blood which he obtained from a donor, the result of eight bites made by three leeches upon the arm, the blood being received in a basin previously sterilized, and injected pure. The first injection gave rise to a vigorous reaction, the second was, however, without local manifestation. Similar injections in tuberculous cases gave excellent results. The following are the conclusions: 1, These injections can be employed in cardiac adynamia when other medicaments fail, and then their dynamic action is certain; 2, they are harmless for donor and recipient, necessitating only the abstraction of a small quantity of blood, and this can be repeated; 3, they are applicable to pulmonary tuberculosis, and one can, as occasion offers, inject the blood of a near relative sharing in the same tuberculous heredity and refractory to the disease. Or, again, injection can be made of blood taken from a local or attenuated tuberculosis.—*Journal des Praticiens*, 1894, No. 17, p. 200.

THE PREPARATION OF CONCENTRATED TESTICULAR LIQUID.

M. A. D'ARSONVAL now prepares this liquid so that it is not only aseptic, but it possesses such antiseptic properties that if it should be contaminated by pathogenic germs, these germs will be rapidly killed or rendered powerless. He figures a macerator and a sterilizer. The testicles are macerated in the apparatus in glycerin for twenty-four hours, and then filtered in the second apparatus through Chardin paper, which has been sterilized in carbon dioxide

under a pressure of fifty atmospheres for three or four hours. It is not certain that the combined action of concentrated glycerin and carbon dioxide under a pressure of fifty atmospheres will result in perfect sterilization, therefore the use of extracts heavily charged with glycerin is persisted in. The new extracts are more active, as has been shown by experiment. The liquid should not be injected pure, but diluted with two or three times its volume of 1 per cent. salt solution, or carbolized water, one per mille. This solution should be made very slowly, so that an intimate mixture may be made.—*Archives de Physiologie*, 1894, No. 1, p. 172.

ANTIRABIC SERUM.

DRS. G. TIZZONI and E. CENTANNI have endeavored to produce a serum which should have a higher immunizing strength and applicable to man. In order to accomplish this, and have the material in a permanent condition, the immunizing strength should be at least 1:300,000, and the dose of the powder for a man of average weight would be not quite three and one-half grains dissolved in five times its weight of water. The results should be even more favorable in man, because he is less susceptible to rabies. Experiments with sheep and dogs show that the serum reached its highest point of antirabic activity at about the twenty-fifth day after vaccination, when it was of the strength of 1:25,000 to 50,000. In comparison with the Pasteur vaccine, the present serum offers the following advantages: activity in every period of incubation to the first appearance of the first symptoms of rabies; the action commences immediately; entire absence of virulence or unpleasant effects; rapid treatment with one or a few injections of a small amount of material; complete solubility, and therefore rapid absorption; its longer preservation in a dry state, so that it can be readily used by the physician at the home of the patient. It is hoped that the use of this serum will soon be commenced for man, and it will then be put to the severest test, the cure, in man, of rabies which has already developed.—*Berliner klinische Wochenschrift*, 1894, No. 8, S. 189.

SPORADIC CRETINISM TREATED BY THYROID FEEDING.

DR. BYROM BRAMWELL, regarding sporadic cretinism as an infantile form of myxœdema, has made use of thyroid extract. The commencing dose was five minims, which two days later was increased to seven. The latter dose produced vomiting, an excited condition, grunting, and laughing, with the rise of temperature about one degree. The next day the dose was reduced to five, and five days later an additional evening dose of three minims was added. In consequence of this dose the patient became excited, could not sleep, and was in a hysterical condition. This excitement was followed by considerable depression. Three days later the dose was diminished to the original one; further increase always resulting in excitement, the original dose was regarded as the maximum one which could be borne satisfactorily. At the end of the first week the treatment had produced a marked effect, the swelling of the tongue, lips, and body generally was lessened, the patient swallowed better, she looked bright, and seemed to fix and follow an object with the eyes in a way which she did not before do; the mouth was frequently

closed; the skin was not nearly so rough and harsh. Nine days later the patient looked much brighter and was thinner; the firm myxœdematous infiltration of the tissues seemed to have entirely disappeared; the skin was much less harsh and dry, and was peeling on the legs and feet; her mental condition was much more lively; the constipation had almost entirely disappeared. About a month after the commencement of the treatment she passed through an attack of influenza. After six months' treatment great improvement was remarked; a gain of over six inches in height; cutting of four new teeth; better able to support herself upon her legs. The general result of the treatment has been that the œdematous infiltration of the tissues rapidly subsided, and in the course of a few weeks disappeared; the patient is now lively, and a considerable amount of improvement has taken place.—*British Medical Journal*, 1894, No. 1723, p. 6.

THE TREATMENT OF DIABETES.

DR. CH. ELOY, following Worms, divides the cases into three groups: 1, those easily reducible; 2, those irreducible; and, 3, those which are transitory or periodic. The moral treatment is important; quiet of mind; travelling. So far as concerns the diet: if a meat diet with simply a reduction of the amount of bread, with the proscribing of starches and sugars, remove the sugar from the urine within forty-eight hours, this will be sufficient. If not, then an exclusively meat diet becomes necessary. In the reducible form a certain tolerance for starches and sugars is acquired, which can be found on experimentation, and this amount can be allowed if there is no polyuria. In the irreducible form a more strict diet is necessary. In the intermittent form there must be an energetic intervention, daily analyses, and a prompt reduction of sugar; later the diet may be chosen according to the power of the organism for burning up the excess of sugar. With the diet the use of the alkalies (Vichy), of sulphate of quinine in daily dose from three to five grains, either alone or with arsenic, cold lotions about the head, repeated morning and night, and saline purgatives, promise the best results.—*Journal des Practiciens*, 1894, No. 8, p. 88.

THE TREATMENT OF SYPHILIS.

DR. EDUARD LANG, although believing that with few exceptions mercury and iodine are unsurpassed remedies for this disease, yet holds that the time, duration and method of application are widely dissimilar. In many cases the curative effect of sarsaparilla is unmistakable, particularly the concentrated decoction being preferred, preliminary to mercury or the iodides. Whether the soda or potash iodide is used is unimportant, the dose in obstinate cases may be one hundred and fifty grains, but usually thirty grains per day is sufficient. If necessary it can be administered *per rectum*, as Köbner has recommended, in 1 to 2 per cent. solution in water, milk, or in a nutritive enema. With codeine a grain to a drachm each of the potash salt, and distilled water, it can be used hypodermatically without great pain. With mercury, cancerous, nephritic, tuberculous, and malarious processes do not react well, and there is even danger of administering it in the hemorrhagic

diathesis. Even unexpectedly, ordinary doses may give rise to serious, even fatal poisoning. The administration of mercury in pill form presents many sources of error in dosage, some of which are obviated in his *grauen Pillen*, which are composed of proto-iodide of mercury, 3; extract of opium, 1; lanolin, 3; and sugar of milk 9 parts, the dose being regulated. In this pill the lanolin melts within the body and the sugar of milk dissolves, so that the mercury becoming free is readily absorbed. Calomel, or the corrosive chloride, in proper dose, may be substituted for the proto-iodide. In general the method of administration by pills is not to be preferred, nor by inunction have we any opportunity of knowing how much is absorbed. The same disadvantage is apparent in the injection of unstable compounds. The site selected for the injection of his *oleum cinereum* (see AMERICAN JOURNAL OF THE MEDICAL SCIENCES, vol. ciii., p. 576) is at the junction of the neck and back about two inches from the median line, on either side, which will permit of five or possibly six injections each. If more than one series is necessary they can be made in a vertical line about two inches exterior to the first. It is claimed that this method is practically free from inconvenience, and gives a sure and rapid cure.—*Centralblatt für die gesammte Therapie*, 1894, Heft 1, S. 1.

THE CLINICAL EFFECTS OF HYOSCINE HYDROBROMATE.

MR. GORDON SHARP has found that although this drug is an isomer of atropine and hyoscyamine, its clinical effects resembled in every way those of atropine. Pharmacologically the drug appeared to resemble atropine (frogs), and chemically it differs from it in that it only slowly reduces mercuric chloride while the former reduces it rapidly. He reports three cases. In the first was observed dilated pupils, rapid pulse and accelerated respiration, dryness of the throat, flushed face, pleasing fancies—if one might so believe from the smile which every few minutes passed over his face. The points of most interest were the partial paralysis of the muscles of speech and deglutition and of the eyelid. In the second case the dilatation of the pupils, flushing of the face, acceleration of pulse and respiration, dryness of the throat, and incoherent mumbling were noticed. Consciousness was lost, and finally death occurred, probably hastened by the great stimulation of the circulation and of the respiratory centre. In the third case, when one-seventy-fifth of a grain was administered with the object of relieving headaches and sleeplessness, the patient became “funny,” the throat was dry, she had severe jerkings of the limbs, and became so delirious that she alarmed her attendants and even the physician. He concludes that the action of hyoscyne differs little in its action from atropine, and until more is known of its chemistry, pharmacology, and clinical effects, it can hardly be recommended as a safe hypnotic.—*The Practitioner*, 1894, No. 307, p. 22.

THE DOSE OF SANTONIN.

DR. D. H. BERGEY has often made use of ten-grain doses of this drug for its emmenagogue effects, and has never learned of the slightest discomforts from such a dose. He rarely administers more than a single dose, and if more is required waits twenty-four hours before repeating it. He does not

believe that it is possible to produce a miscarriage or an abortion by it, but it is a safe remedy to use for suppressed menstruation.—*The American Therapist*, 1894, No. 7, p. 215.

HYDROGEN DIOXIDE (PEROXIDE OF HYDROGEN).

DR. EDWARD R. SQUIBB, recognizing the erroneous, misleading, and confusing character of the literature, presents a very thorough and scholarly paper upon the manufacture, testing, and preservation of this product. He recommends the use of barium dioxide, BaO_2 (commonly known as peroxide of barium, and which as imported contains from 78 to 93 per cent. of barium dioxide). This product is assayed to determine its exact percentage; it is then sifted into water constantly stirred, and is then allowed to stand until sufficient hydration is obtained, when the magma is diluted and strained. It is then treated with phosphoric acid, of which the so-called syrupy phosphoric acid contains 83 to 91 per cent., being continuously stirred, and the solution of hydrogen dioxide filtered off. To remove the small proportion of acid barium phosphate, sulphuric acid is gradually added during constant stirring. The best preservative against decomposition has been found to be a mixture of boric acid and glycerin in about the proportion of 62 to 92, boiled down to 130 parts, and added in the proportion of 1 per cent. An important collateral advantage of this agent is that it is not objectionable, as its influence and effects are in the same direction as that of the solution. Of the different acids used by manufacturers to decompose the barium dioxide, hydrofluoric acid is a hurtful irritant; traces of sulphuric acid are also objectionable.—*The Ephemeris*, 1894, No. 2, p. 1545.

THE TREATMENT OF CHLOROSIS.

DR. P. LE GENDRE believes that almost all chlorotics are also dyspeptics, from a simple gastric atony to dilatation accompanied with deficiency of hydrochloric acid. Some suffer from an intermittent hyperacidity, especially when the stomach is empty, such being exposed to dangers of gastric ulcer. For the dyspeptics he orders: 1. Before the meals, simple bitters, as quassia, or the excito-motors of muscles, as strychnine. 2. At the end, or half an hour after the meal, the hydrochloric acid lemonade (3 or 4 to 1000 parts), a wine to a full glass in quantity, the latter to be taken through a glass tube. If gastric dilatation is present, naphthol, bismuth salicylate, or chloroform water, three or four hours after meals, is useful. If there is hyperacidity, antacids, as soda bicarbonate, prepared chalk, or calcined magnesia may be administered, one and a half or two hours after meals. Milk, with alkalies, or beer is better suited to the dyspeptic chlorotics than stronger alcohol or wines. Inhalations of oxygen, baths of compressed air, are frequently of great service. In administering iron the choice must be made of a preparation which is easily assimilated, the proportions must be varied, and the remedy should be taken in the midst of the meal to avoid contact with the gastric mucous membrane. The organic salts, oxalate, potassio-tartrate, citrate, and lactate, or reduced iron, have given good results; so also the ferruginous mineral waters, as Forges, Spa, can be used. Constipation must be obviated by vegetable laxatives, as cascara, rhubarb, podophyllin, and intestinal excito-

motors, and by irrigation of the large intestine. Hydrotherapy is an excellent auxiliary, from cold application and wet sheets to the douche. It should, however, be used with caution with very weak or excitable chlorotics. Salt and sulphur baths also render good service.—*Revue de Thérapeutique Médico-chirurgicale*, 1894, No. 4, p. 92.

THE TREATMENT OF PERNICIOUS ANÆMIA BY ARSENIC.

DR. J. S. RISIEN RUSSELL reports a single case in which the treatment was begun with four minims of liquor arsenicalis and fifteen grains of the ammonio-citrate of iron, three times daily; the dose of the latter was not increased. The former was increased gradually until, within five weeks, the patient was taking twelve minims three times a day. About three months after this treatment was begun, irritation of the eyes became troublesome, and it was discontinued. The iron, however, was given in twenty-grain doses thrice daily. Two weeks later, four minims of the liquor arsenicalis in combination with the original dose of iron was given, the arsenic being subsequently increased to six minims, and the treatment was discontinued altogether about two months later. The shortness of breath, œdema, and appetite improved, and in general his urgent symptoms were relieved, and one year later he looked and felt perfectly well. Although iron was used in addition, it is believed that arsenic alone was responsible for the cure, because during the time when the arsenic was omitted, and he was taking the iron alone, he relapsed.—*British Medical Journal*, 1894, No. 1728, p. 298.

THE TREATMENT OF CHRONIC RHEUMATISM.

DR. DUJARDIN-BEAUMETZ divides chronic rheumatism into three groups: 1, rheumatismus deformans (Charcot); 2, chronic, succeeding an acute rheumatism; 3, the multiple manifestations in chronic course of a rheumatic. The first group must be treated for a disturbance of nutrition, and arsenic and the iodides give the best results. Fowler's solution, sodium arsenate, arsenous acid are useful, but arsenical baths—because it has been proven that an intact skin does not absorb medicinal solutions—are likely to be therapeutic illusions. In the iodine treatment, the iodine itself is not to be preferred to the iodides, because, even if administered in wine, it irritates the stomach. Of the iodides, an average daily dose of fifteen grains is sufficient; as a potassium iodide, or as sodium iodide with the sodium bromide and chloride, or in alteration with gold and sodium chloride. For the painful crises, phenacetine gives the best results. Paracetphenetidine, in seven-grain doses, is a powerful analgesic. The diet is the opposite to that of the gouty: meats, green vegetables, generous wines and milk. The external treatment consists in electricity and balneotherapy. The chronic rheumatisms of the second class are relieved by the salicylates, and they as well have a preventive action. Fifteen to thirty grains per day, or, in some cases, asaprol, and more rarely phenacetine, are required. But the essential cure of this rheumatism is external treatment, massage, electricity, and balneotherapy. The massage, methodically employed, and with care, during the period of quiescence, benefits the functional impairment of the joints, and as well the accompanying muscular atrophy. The muscular atrophy is benefited by

electricity, by continued or slowly interrupted currents. The baths at Aix, Bourbonne, Plombières, and Dax, particularly the mud-baths at the last station, give excellent results. For diet, a mixed one, in which vegetables form a large part is indicated. It is important that the different emunctories shall act properly, and laxatives and diuretic liquids should be employed, white wine or milk. In the last form it is the diathetic condition which must be opposed; here the thermal waters and regulated diet are important. Muscular pain and neuralgias of rheumatic origin are relieved by antipyrin, and especially phenacetine, which should be placed by the side of sodium salicylate and asaprol. In this class also the bowels should be kept open and the kidneys active, and in the latter case the action of antipyrine in diminishing the urinary secretion may be a disadvantage. To assist the skin in performing its functions vapor baths, Russian baths, warm or Scotch douche, even the cold douche, are excellent methods. As for the thermal stations, especially are to be considered Dax, and afterward Plombières, Aix-les-Bains, Bourbonne-les-Bains, Bourbon-Lancy, the last particularly for the visceral manifestations, the myocardites. The diet should not include any substance which can contain toxic ptomaines. Game, fish, shell-fish, mushrooms, old cheese, should be guarded against, while a vegetable diet, milk, and fruits are useful.—*Bulletin général de Thérapeutique*, 1894, 6th liv., p. 97.

MEDICINE.

UNDER THE CHARGE OF

W. PASTEUR, M.D. LOND., F.R.C.P.,

ASSISTANT PHYSICIAN TO THE MIDDLESEX HOSPITAL; PHYSICIAN TO THE NORTHEASTERN HOSPITAL FOR CHILDREN;

AND

SOLOMON SOLIS-COHEN, A.M., M.D.,

PROFESSOR OF CLINICAL MEDICINE AND APPLIED THERAPEUTICS IN THE PHILADELPHIA POLYCLINIC; PHYSICIAN TO THE PHILADELPHIA HOSPITAL.

A LARGE CEREBRAL TUMOR WITHOUT HEADACHE AND EYE-GROUND CHANGES.

PEL (*Berliner klinische Wochenschrift*, 1894, No. 5, p. 106) has reported the case of a woman, forty-six years of age, who came under observation on account of weakness of the right arm, difficulty in walking, nervousness, and impairment of memory. These symptoms had developed insidiously during the preceding year, without recognizable exciting influence. There had been no traumatism, and there was no history of syphilis or of alcoholism. The first symptom had been a feeling of numbness at the tips of the fingers of the right hand, to which motor weakness was soon added. The loss of power gradually progressed, and in a short time the forearm, and later the arm also, became paretic. At the end of a year the right leg began to display evidences

of weakness, while at the same time it was noted that the memory was failing and cerebration was difficult. The woman became markedly emotional, and was annoyed by her condition. At about this time she was suddenly seized with a convulsive attack, in which consciousness was not entirely lost, and the right arm and leg, and the right side of the face, were jerked, and after which, speech was difficult and labored, with an inability always to recall the proper word, with some stuttering and the repetition of the same word. There had at no time been headache, nausea, vertigo, or vomiting. Vision and hearing were undisturbed. Percussion gave rise to no more pain upon one side of the head than upon the other. The appetite was impaired, the bowels regular. The urine was normal in amount and constitution. The functions of bladder and rectum were not deranged. Intelligence was obscured, the appearance dull. The paralyzed members were cyanotic and swollen. The pulse was small, regular, soft, alike on both sides, and neither accelerated nor retarded; the vessels were a little rigid. Respiration was normal in frequency and rhythm. Both eyes could be closed with equal firmness and opened equally wide. All of the ocular movements were well performed. The pupils reacted promptly to light and in accommodation. There was no nystagmus, and the visual fields were not altered. Careful examination failed to disclose a lesion of the fundus. Common and special sensibility was not deranged. The tongue, when protruded, deviated slightly to the right. Speech was monotonous, and of the character of an incomplete motor and amnesic aphasia. At times there was distinct paraphasia. There was also alexia, the patient skipping some words, reading others correctly, and not comprehending what she read. Writing was impossible on account of the paralysis of the right hand. The left ventricle of the heart was dilated and the second sound accentuated. No abnormality was found in larynx, pharynx, thoracic and abdominal viscera, and the vertebral column. The paralyzed right arm was somewhat contracted, and almost all of its muscles, as well as some of the muscles of the shoulder, had undergone a not inconsiderable degree of atrophy. From time to time small clonic movements appeared in the right hand, extending to the right side of the face, and eventually to the right lower extremity. The deep reflexes were exaggerated. The palsy and the atrophy were not so marked in the right lower extremity as in the upper. Station was tremulous and exceedingly unsteady. The cutaneous reflexes were less distinct upon the right than upon the left. The knee-jerk was greatly exaggerated upon the right side. Leg-clonus and foot-clonus were distinct. The periosteal reflexes were also increased. The left side of the body was intact, although from time to time slight tremor appeared in the upper extremity, increased by voluntary movement. The electric reactions were unchanged. While under observation the patient had several convulsive seizures, unattended with loss of consciousness or of pupillary reflex irritability. In these the eyes were moved from side to side; then followed twitching of the right thumb and the fingers of the right hand, which was thus alternately closed and opened; next succeeded twitching of the right arm, slight movements in the right side of the face, and finally in the right lower extremity. The paroxysms lasted for two or three minutes, and were attended with a sense of painful tension. After one of the attacks tremor persisted in the right leg. The impairment of memory and of intelligence progressed,

and the convulsive seizures recurred from time to time. Later in the progress of the case, occasional headache was from time to time complained of, but only upon inquiry. The left parietal region also became more sensitive to percussion than the left. The fundus oculi was still unaltered. In spite of the absence of changes in the fundus, of nausea, and of vomiting, and particularly noteworthy, of headache, a careful analysis of all the details of the case led to a diagnosis of cerebral tumor situated in the left central region. After a faithful trial of all available therapeutic measures, including potassium iodide and mercury, but without success, operation was undertaken. Upon opening the skull over the left arm centre and division of the dura, a tumor having the form and size of a large chestnut, measuring $6\frac{1}{4}$ or $6\frac{1}{2}$ inches in circumference, 2.1 inches long, $1\frac{3}{4}$ inches wide, and 1 inch thick, was exposed to view. The mass was distinctly circumscribed, adherent to the membranes in only one situation, and was readily removed. It did not involve the cerebral structure, which it had only displaced. On microscopic examination, the growth presented the histologic appearances of a soft fibroma, originating from the pia. The patient unfortunately died shortly after the operation from cardiac failure.

THE VENOUS AND HEPATIC PULSES AND THE ARRHYTHMIC CONTRACTION OF THE CARDIAC CAVITIES.

JAMES MACKENZIE (*Journal of Pathology and Bacteriology*, vol. ii., Nos. 1 and 3) points out that, so far as clinical methods of examination are applicable to the study of the heart, they nearly all have reference to the condition of the left side; although, if carefully sought, symptoms connected with the right side are not of infrequent occurrence. Of these symptoms, the most striking and the most instructive is the pulsation of the veins, which, in a sense, bears a relation to the right heart comparable to that which the arterial pulse bears to the left. The venous pulse, however, offers a different kind of knowledge, inasmuch as it is itself a pathologic manifestation that gives information regarding the condition of both the right auricle and ventricle, while the arterial pulse affords direct knowledge of the left ventricle only. The venous pulse, too, presents a greater variety of features, and is subject to influences so subtle that it may manifest variations with the changing condition of the patient, during which the arterial pulse reveals no appreciative variation. A full comprehension of the import of these variations would enable an understanding and a combating of certain diseased conditions of the heart as yet very obscure and ill defined. As the result of an elaborate and painstaking investigation, Mackenzie has found that the form assumed by the venous pulse in the slightest degrees of cardiac derangement is that in which the movements of the auricle are added to the venous current; that is, there is a wave in the veins due to the auricular systole and a depression due to the auricular diastole. There is usually present a smaller wave (the ventricular), in the mildest forms of regurgitation, occurring after the closure of the pulmonary valves. With increase of regurgitation this ventricular wave appears before the time of closure of the pulmonary valves; but the latter portion of this wave is always the most pronounced, and the time of closure of these valves is indicated by a sudden increase in the size of the ventricular wave.

In some advanced cases of tricuspid regurgitation this earlier portion of the ventricular wave encroaches upon the time occupied by the auricular depression, and both auricular wave and depression become less marked as the ventricular wave increases, until finally the auricle ceases to impress its movements upon the venous current. The ventricular systole and diastole are then communicated directly to the venous current and produce the ventricular form of venous pulse. In the same manner the hepatic pulse may undergo variations, but the regurgitant effects are not evident in the milder cases, only occurring when there is some organic disease of the heart giving rise to forcible regurgitation. The hepatic pulse also assumes features similar to the auricular and ventricular forms of the venous pulse, with some slight modifications depending upon the difference in structure. There is also a movement communicated to the liver from the variations in size of the ventricular cavities. This movement appears to be a diastolic depression and a systolic recession, and is therefore at variance with the time usually assumed for the recurrence of these movements. When the heart's action is quickened there is a change in the form of the auricular venous pulse, consisting, first, in the disappearance of the period of stasis between the ventricular depression and the auricular wave; and, second, in a disappearance of the ventricular depression and a blending together of the ventricular and auricular waves. There is some probability that the contraction of the superior vena cava may manifest itself in the venous pulse. There is evidence that the variations in the venous pulse may be useful to indicate variations in the blood pressure, certain influences being found to further the increase and others to produce the disappearance of the venous pulse. The observation of the venous pulse, with the left heart action, serves as the best means of determining the lack of harmony between the contraction of the different heart-chambers. The cases of irregular heart-action studied are separated into seven groups: 1. Those in which there is complete agreement in relative rhythm during certain phases of irregularity of the right auricle and ventricle and left ventricle. 2. Those in which there is an exaggerated auricular impulse during this period of irregularity. 3. Those in which there is a maintenance of the periodicity of action of the right auricle during irregular action of both ventricles. 4. One in which there is a persistence of the auricular systole during a pause in the ventricular systole. 5. One in which there is a contraction of the right ventricle during a pause of the left. 6. One in which there is complete discordance in the action of the two sides of the heart. 7. One in which there is a probable displacement of the relative time of the right and left heart-movements.

PAROXYSMAL TACHYCARDIA.

LANGE (*Pittsburg Medical Review*, vol. viii., No. 2, p. 39) gives a good delineation of the symptom-complex included in the designation paroxysmal tachycardia, and relates two cases. He observes that examination of the patient during the attack will show that the pulse cannot be correctly counted at the radial, the carotid, or the temporal. On auscultation, it is difficult, often impossible, to differentiate the first from the second sound. The first sound may be divided, the contractions of the ventricles being asyn-

chronous. Finally, every wave of blood does not reach the radial artery. A foetal character is imparted to the heart-sounds, which are, as a rule, distinct and clear, although at times a slight blowing systolic murmur may be heard. On palpation the impact of the heart is wanting, and is replaced by a series of diffused vibrations. Percussion demonstrates some increase in the area of cardiac dulness to the left, but much more downward over the right ventricle. This increase is but transient, and disappears with the cessation of the attack. The urine passed during the attack may be of increased specific gravity, containing an excess of urates, but no albumin. The face is pale, and the lips may be cyanotic. No undue fulness of the veins of the neck and chest can be detected, and there is no cough. When an attack has continued for many weeks, the liver can be shown to be enlarged, and fine mucous râles may be heard low down behind. Therapeutically, sedatives such as the bromides, hydrocyanic acid, Calabar bean, and conium, have been found effectual in bringing the attack to an end. Cold and heat have acted similarly. In one of the cases reported the attacks could be aborted or brought to a close by deep inspirations held for fifteen or twenty seconds.

CHANGES IN THE BONE-MARROW IN PERNICIOUS ANÆMIA.

FROM a careful study of five cases of pernicious anæmia, MUIR (*Journal of Pathology and Bacteriology*, vol. ii., No. 3, p. 354) finds that the changes most frequently observed in the bone-marrow in this disease may be said to be: 1, An increased number of nucleated red corpuscles in the marrow; 2, transformation of the fatty marrow in the shafts of long bones into red marrow; 3, absorption of the bone-trabeculae between the red marrow. A further change that may be found in cases of long standing is the occurrence in large numbers of large, nucleated red corpuscles (gigantoblasts), reaching $20\ \mu$ or more in diameter, often with fragmented and apparently degenerated nuclei. Along with these there is generally a distinct preponderance of colored over colorless elements in the marrow. The condition of the marrow in this advanced stage appears to be peculiar to pernicious anæmia. The newly formed marrow, in its cellular constituents and structural arrangement, closely resembles normal marrow. The eosinophile cells are specially few at first, but become more numerous afterward. The giant cells, whose development can be traced from marrow cells, are generally comparatively small and few in number. In the transformation of the fatty into the red marrow there are two main factors—viz., a widening of certain capillaries to form venous capillaries and an accumulation of marrow cells (leucocytes) around them. Afterward the demarcation of the vessels becomes deficient and the usual marrow structure reached. No special cells are concerned in the process of the absorption of bone that occurs; the gradual softening and simple atrophy appear to take place, associated with hyperplasia of the marrow. Pigment, much of which yields the reactions of iron, may be present in the newly-formed marrow in considerable amount, occurring both in the free state and also within cells. It has been found especially abundant when the anæmia was severe and progressing at the time of death. The earlier changes can only be interpreted as an extension of blood-forming tissue of compensatory nature, due to blood-destruction, the changes 1 and 2 being

similar to those that follow hemorrhage, and being found also in other diseases. The further changes found in advanced cases are also secondary, and are due to a long continuance of the same conditions, the nucleated red corpuscles showing a return to an embryonic type.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE
UNIVERSITY AND GERMAN HOSPITALS:

ASSISTED BY

ALFRED C. WOOD, M.D.,

AND

C. L. LEONARD, M.D.,

INSTRUCTOR IN CLINICAL SURGERY, UNIVERSITY
OF PENNSYLVANIA; ASSISTANT SURGEON,
UNIVERSITY HOSPITAL.

ASSISTANT INSTRUCTOR IN CLINICAL SUR-
GERY IN THE UNIVERSITY OF
PENNSYLVANIA.

ANILINE PRODUCTS IN THE TREATMENT OF CARCINOMA.

MEYER (*Annals of Surgery*, November, 1893) summarizes his opinion of this method of treatment as follows: "The use of the aniline dyes in the treatment of inoperable carcinoma (malignant growths generally) is 'a palliative treatment,' not a cure. In *very* rare cases this treatment may cure. Carcinoma and sarcoma of hard type (especially sarcoma) are more influenced than soft ones; those of the soft tissues more than of the bones; those with a scanty blood-supply more favorably than rapidly growing neoplasms with abundant circulation. The disseminated cancer is not suitable for the aniline treatment. The treatment by parenchymatous injections requires a perfect knowledge and application of the principles of aseptic and antiseptic surgery."

The treatment is suitable only for inoperable cases and should never be tried where an operation is possible. It is tedious and time-robbing—the necessary precautions of antisepsis make it so—and also expensive, so that it is suitable for the rich only, outside of hospital practice. The treatment will require a continuous attendance for many weeks or months.

The method of treatment is as follows: "A very handy shape of the pure drug is the pyoktanin (cæruleum or blue) pencil. If dipped in water and then rubbed on the surface of a sore, ordinary cancerous or sarcomatous, it easily makes a crust, a dry eschar, under which cicatrization often rapidly goes on. The standard solution for parenchymatous injection is 1:500. It forms no sediment if filtered through asbestos. The solution is to be kept in a dark bottle with glass or rubber stopper. Only a small quantity—about one ounce—should be prepared at the time; still better is it to prepare it fresh for each injection. For external application in moist dressings a higher percentage can be applied."

The *technique* in general consists of antiseptics in instruments, hands, and skin. The needles should be kept in alcohol, and boiled after each using. "The syringe is an ordinary well-working aspirator which holds two drachms. Before and after using it is washed inside and outside with a 5 per cent. carbolic solution. It shall be used only for this purpose. The amount of solution varies from one-half to three drachms, according to the size of the growth. The spot where the needle entered is compressed after the withdrawal of the needle with a ball of moist antiseptic cotton until all oozing has ceased. It is then rubbed with ether and covered by a small piece of antiseptic gauze, fastened by pyoktanin, or iodoform, or ordinary collodium. Any other dressing is superfluous. It is wise in the beginning of the treatment to distribute the dye throughout the entire tumor as rapidly as possible. The injections are, therefore, better made every other day, later every third day regularly."

The effects produced are: 1. The analgesic; this is most important and marked. 2. The improvement of function in the part involved. 3. The general condition is unmistakably changed for the better. No dangerous symptoms have ever been seen, although occasionally there are present annoying symptoms. "In no case did the injections ever prove really harmful to the patient." A general local improvement is seen in the growth accompanied with œdema sometimes; this, however, is never serious, and disappears on massage. Breaking down of the injected tissue is sometimes seen, and a number of sinuses may form or may unite to form a cavity that, if punctured and treated antiseptically, heals quickly. In general, the effects of this method of treatment are favorable, and the author believes there have been cases cured, though it is a palliative rather than a curative treatment, and produces best results as such.

THE TECHNIQUE OF GASTROSTOMY.

NICOLAYSEN (*Centralbl. für Chir.*, 1894, No. 4) reported three successful operations, forming gastric fistulæ, that closed of themselves and through which the patient was fed by means of a soft catheter. The fistulæ are direct. The self-closure of the fistula was secured by making a small abdominal opening so that the parietal wall acted as a sphincter. The incision was made parallel to the left costal line; this makes attention to the muscles unnecessary. The serous surface of the stomach was scarified with the point of a needle. In a circle about this area four or six stitches, including the serosa and muscularis, were placed and then carried through the margins of the abdominal wound and tied over rubber drainage-tubes. The serous surface was then sewn to the peritoneum and abdominal muscles within the wound, which was afterward closed by deep and superficial sutures. The opening can be made immediately, or twelve to twenty-four hours afterward, just sufficiently large to admit a Nélaton catheter.

PRIMARY SARCOMA OF THE ARACHNOID.

REYMOND (*Bull. de la Soc. Anat.*, Dec., 1893) reports a very interesting case of a man, thirty-three years of age, having no previous history that bore upon the subject. When first seen he supported himself on two attendants and

could not walk without them; the next day he could not support himself, but at no time was he paralyzed in the full sense of the word. There was no anæsthesia. He cried out when touched. The pupils were dilated. There was amaurosis. There was no albumin in the urine. The psychological symptoms were the most characteristic. There was constant delirium, but not of the ordinary type—it was not noisy as in delirium tremens. His body was calm, but he seemed preoccupied by his business affairs. His temperature range was from normal to 100.4°.

The autopsy disclosed a tumor situated beneath the right orbital lobe, attached to the brain and adherent to the dura mater. The microscopical examination showed it to be a sarcoma not uniform in structure; the portion next to the brain was more vascular, the arteries were enlarged and their walls thickened by infiltrated sarcoma cells. The sarcomatous cells were large and flattened and a little heaped up one upon another. The further from the gray matter the less vascular the tumor became and the more elongated the cells, and formed into fasciculæ. The newest portion of the growth was apparently that next to the brain.

The tumor in portions was not sharply defined from the brain, in others it was separated by hemorrhagic areas; a careful examination showed these to be situated at the position of the sulci, between the convolutions. On the cerebral side of these hemorrhagic areas the pia mater could be clearly seen, while in the intervening portions corresponding to the convolutions it was absent. It thus became evident that the tumor arose from the arachnoid primarily, that the hemorrhage occurred beneath that membrane in the sulci, where it is normally separated from the pia mater, and thus prevented the destruction of the pia which had occurred over the convolutions.

STUDIES OF THE INTESTINAL FORM OF PERITONITIS.

UNDER this title P. ZIEGLER (*Rieger, München*, 1893, pp. 58; *Centralbl. für Chir.*, Feb., 1894) studies: 1. The power of bacteria to pass through the strangulated intestine. He concludes that so long as the glistening appearance remains and until there is a fibrinous deposit, they cannot penetrate. 2. The most infectious form of bacteria is the bacterium coli, and that fecal matter carries the infection. Without bleeding, the perforation of the intestine and passage of fecal matter, either solid or in solution, into the peritoneum, will cause a fatal peritonitis. The smaller the amount the more lingering the death. Very small quantities may be eliminated. The fewer the corpuscular elements in the extravasated matter the less virulent the infection. Death is caused by nerve irritation.

Operative interference is indicated: 1. For all punctured and incised wounds immediate laparotomy, except when the wound is large enough for all purposes. 2. For gunshot wounds the same treatment. 3. For all small punctured wounds immediate enlargement of the wound followed by laparotomy if necessary.

AN ENORMOUS EPITHELIOMA OF THE RIGHT KIDNEY.

BERNARD (*Bull. de la Soc. Anat.*, Dec., 1893) reports the case of a rheumatic atheromatous patient having in the right side of the abdomen a tumor

which had been there for seven years. There had been two hæmaturia in six months previous, with lumbricoidal clots passed in the five following days. There had been no subsequent hemorrhage. Physical signs were an enormous tumor of the right kidney; emaciation; yellow color. There had been persistent vomiting until three months before death. The urine was characteristic of interstitial nephritis, density low, pale in color, abundant, and always without albumin. In the three last months a perinephritis developed which opened on the thigh by way of the psoas muscle. There were sacral and trochanteric eschars and ulcer of the right cornea.

The autopsy showed a tumor extending from the liver to the iliac crest. Its relations were as follows: Beneath cæcum filled with gas; in front colon flattened out; in its upper portion the colon formed a very acute angle, so that the initial portion of the colon, distended with gas, passed over the antero-lateral aspect of the tumor. The mesentery of the small intestine and the duodenum arose from the posterior surface of the tumor. The aorta and vena cava were not involved.

THE DIAGNOSIS OF POSTERIOR URETHRITIS.

LOHNSTEIN (*Deut. med. Wochenschr.*, 1893, No. 44) believes that in the methods of Thompson and Goldenberg-Jadasson there are fallacies introduced by the regurgitation from the pars membranacea into the bladder and through the action of the compressor urethral muscle. He advises the following method of procedure: The anterior portion of the urethra is washed out by means of a Nélaton catheter with a 0.5 per cent. solution of potassium ferrocyanide until there are no threads in the water. Then there follows a washing with warm water until the water does not give the Berlin-blue reaction upon saturation with chloride of iron. The patient then urinates, and the urine is examined for threads by adding chloride of iron.

There are possible the following four conditions: 1. The urine is clear and remains yellow on the addition of the chloride of iron. 2. The urine is clear, but turns blue on the addition of the chloride of iron. 3. Threads are present, but the urine remains yellow. 4. Threads are present and the urine turns blue. Only in the last condition is a certain diagnosis impossible; in the other three it is clear. Only further and later examination can decide in the last form.

SUPPURATIVE PYLEPHLEBITIS; LAPAROTOMY; RECOVERY.

FREDERICK TREVES reports the following very instructive case (*Lancet*, London, 1894, vol. i., No. 11): A young lady, aged fifteen years, was seized with symptoms of perityphlitis, ten days after an ocean voyage, during which, in addition to full meals, she had eaten large quantities of nuts and candy. She had an attack of perityphlitis four years before, and another two years prior to the one reported. She was of constipated habit. The attack began with sudden pain in the abdomen, vomiting, coated tongue, and moderate fever, which reached 104° on the third day. The symptoms gradually ameliorated, until the eighth day, when there was a severe rigor, the temperature registering 103°. The condition was thought to be due to stercoral ulcer. From this time on she pursued an irregular course, gradually becoming weaker and

more emaciated as a result of her disease, with the accompanying fever and vomiting. On the thirty-first day Mr. Treves was asked to perform exploratory cœliotomy on the supposition that an abscess of the liver existed. At this time the patient was very ill, she was emaciated, very prostrate, the forehead was wrinkled, and she appeared in a state of ceaseless anxiety. Pain was complained of "all over," but marked tenderness was manifest only over the liver.

An incision was made in the right semilunar line. There were no peritonitis, no ascites, and no adhesions. The cæcum appeared normal; the appendix was healthy and freely movable. The gall-bladder exhibited no morbid changes. The appearance of the liver was remarkable. It was enlarged, of normal color, but its consistence was as soft as a lung. All of the exposed portion was dotted with minute yellow specks, perfectly round, and the size of an ordinary pin-hole; they were not perceptible to the touch. The region of the fissure of the portal vein was examined, but nothing peculiar was noted. The patient made a rapid and uninterrupted recovery, and at the time of the report, eighteen months after the operation, her health had remained sound.

It is suggested that the case was one of typhlitis or perityphlitis followed by pylephlebitis. The points of particular interest are: 1. All cases of perityphlitis do not depend upon a previous appendicitis, even where there have been repeated attacks (in the present case the appendix was entirely healthy). 2. The rapid and complete recovery following exploratory cœliotomy; and 3. Recovery after pylephlebitis. In connection with the second feature, the author calls attention to the monograph of J. William White on "The Curative Effect of Operation *per se*," in which a very large number of cases have been collected where simple exploration has been followed by amelioration or cure of apparently malignant conditions.

Treves has seen one other case in which recovery took place. The textbooks teach that the condition is commonly fatal.

OPERATIVE TREATMENT OF SUCH HERNIÆ AS APPEAR THE RESULT OF CONGENITAL DEFECT OF THE LINEA ALBA OR AS THE OUTCOME OF LAPAROTOMY.

M'ARDLE contributes the following interesting observations to the *Dublin Journal of Medical Science*, 1894, 3d series, No. 266. The first case described is that of a woman, aged fifty-one years, who had had for many years a small nodule beneath the skin above the umbilicus. Suddenly, during an effort at lifting, an umbilical hernia developed. This was operated upon by the author, and was found to consist of a knuckle of small intestine and a large mass of omentum. The latter was so much altered that it was necessary to excise it. Patient made a complete recovery. The nodule alluded to was found to be a sub-peritoneal fatty hernia. The author remarks that if this had been operated upon, the hernia would doubtless not have developed.

The second case was a woman with an irreducible umbilical hernia the size of a child's head, who was brought to the hospital with symptoms of strangulation. Operation was performed promptly, the intestine being returned and the omentum ligated and excised because the numerous adhesions

would require more ligaturing than the stump; the abdomen was already full as it could well be, and finally the mass showed a low grade of inflammation. The author remarks that life was saved by prompt operation, and intra-abdominal pressure lessened by removing the large mass of omentum, while clearing the edges of the ring, applying a purse-string suture to the neck of the sac, an interrupted suture to the aponeurosis, and deep supporting sutures through the skin fat and abdominal fasciæ resulted in a permanent cure.

The next case was a ventral hernia, following laparotomy, in a woman of twenty-seven. The operation was carried out as in the preceding case. The author explains the occurrence of these herniæ as due to a deficiency of the aponeurosis formed by the union of the external oblique, internal oblique, and transversalis muscles. In the first two cases the cause of the defect was apparent; in the latter it followed laparotomy. The failure of this middle layer of the abdominal wall to unite after incisions is ascribed by M'Ardle to—1. Failure to engage the different layers of this stratum sufficiently in the sutures. 2. Interposition of contuse peritoneum. 3. Hæmatoma not becoming soundly organized. 4. Suppuration from inherent or extrinsic causes. The remedy is the suture of the abdominal wall after cœliotomy as for hernia, to obliterate all cavities in which blood or serum could collect, and by avoiding contusion of the peritoneum by using sharp-pointed catch forceps.

These cases are important in emphasizing the fact that umbilical herniæ, contrary to the usual teaching, are to be treated upon the same general principles as herniæ in other regions.

SUTURE OF THE BLADDER AND THE HIGH CUT.

In a communication to the *Wiener medicinische Presse*, 1894, Nos. 1 and 2, ALBERT urges the claims of the high cut in cases of vesical calculus. He reported his first case of this operation eighteen years ago, and since this time has been enthusiastic in its praises. Brenner and Guyon contend that the value of the operation depends entirely upon the success of the bladder-suture. He quotes Volkmann, who said in 1884 that "lithotripsie and litholapaxy do not belong to our antiseptic times." The improvements in the operative methods for vesico-vaginal fistula in recent years have been useful in indicating the proper technique in suture of the bladder.

Albert's method is as follows: He does not use Petersen's bag. A thread is introduced in the bladder at each end of the proposed incision. These serve to steady the bladder and draw it forward. If successful suture is to be obtained, it is important not to carry the incision down behind the symphysis. If a larger wound is needed, the bladder may be stripped of its peritoneum by blunt dissection and the incision extended in this direction. It is fatal to the cause of primary union of the bladder-wall to draw a stone out through a wound of insufficient size, thereby lacerating and contusing the edges of the latter. If the edges have been lacerated, they should be freshened. With the exercise of great care primary union may sometimes be obtained, but it will be rare. The author contends, however, that this should not induce surgeons to abandon the high operation, but to improve the

technique, so that success may follow more frequently. If primary union, cannot be obtained, however, the wound may be drained.

A SIMPLE APPARATUS FOR THE STERILIZATION OF CATHETERS.

FRANK describes (*Annales des Maladies des Organes Génito-urinaires*, 1894, No. 2) his apparatus for the sterilization of urethral catheters and similar instruments. A sterilizer of suitable size is used. In one end is adapted an upright reservoir, to be filled with water, or, better, 1 per cent. solution of potassium. From the top of this project horizontally several conical tubes to which the catheters are attached. Rubber tubing may be used to make the connections more perfect. The instruments are sterilized externally in the usual manner by the steam from the sterilizer, while the inner surface is made sterile by the jet of steam which passes through from the reservoir described. The reservoir is heated by the liquid in the sterilizer. Frank has infected old and rough rubber and silk catheters with urine from cases of cystitis, and, in addition, pure cultures of the bacterium coli commune, and of charbon, and from these tube cultures were made, which showed abundant growths at the end of three days. After sterilizing ten minutes, tubes were again inoculated, but they remained sterile.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

J. SOLIS-COHEN, M.D.,
OF PHILADELPHIA.

SEPARATE INVESTITURE OF THE PALATO-GLOSSUS MUSCLE.

UNDER the title "Congenital Loss of Substance of one Palatine Pillar" (*Rev. de Lar., d' Otol., et de Rhinol.*, 1894, No. 4), DR. SEIFERT, of Würzburg, reports a unilateral instance of separate investiture of the palato-glossus muscle of the left side, which he has recently observed in a man twenty years of age. A good woodcut shows the tonsil through the slit in the palatine fold. A number of reported cases are collated. These cases are not extremely rare. One or two of them show up every year or two in large throat clinics. Occasionally, as in an instance reported by Schapring, the defect occurs in a subject with hare-lip, an association very rare.

AMPUTATION OF THE TONSILS.

DR. WHITFIELD WARD claims (*Medical News*, 1894, lxiv. 169) that deep injections of from thirty to sixty drops of a mixture of 10 per cent. solutions of cocaine hydrochlorate and of ferrum sulphate in equal parts, will render amputation with the amygdalatome practically bloodless or nearly so.

CEREBELLAR DISEASE AS A CAUSE OF TREMOR OF THE VOCAL BANDS.

TREMOR of the vocal bands has usually been attributed to disseminated sclerosis of the medulla. A case from Garel's clinic, so reported by J. COLLET two years ago, terminated fatally, and at the autopsy Dr. Collet found (*Annales des Mal. de l'Oreille, du Larynx, etc.*, 1894, No. 2) an entire absence of disease of the medulla, with freedom from any alterations in the nuclei of the hypoglossal and pneumogastric nerves, or in their intrabulbar fibres. On the other hand, there was atrophy of the cerebellum and of the bulbo-protuberances, the particulars of which have been described in the *Archives de Neurologie* for November, 1893. This case is made the text of a short but very interesting article with a number of references in point, and concluding as follows:

There is a systematized sclerosis of the cerebellum and of its bulbo-protuberantial extensions, which may give rise to the majority of the symptoms ordinarily assigned to *sclérose en plaques*.

There are troubles of speech and of phonation manifestly caused by this lesion of the cerebellum, inasmuch as the cranial nerves and their nuclei remain sound.

That tremor of the vocal bands is not an exclusive result of *sclérose en plaques*, but may likewise be encountered in sclerous atrophy of the cerebellum, and that consequently it cannot be referred to a mechanism always identical.

LARYNGEAL PARALYSES.

THE difficulty sometimes encountered in recognizing the origin of laryngeal paralysis has been well exemplified in the case following:

At the meeting, December 1, 1893, of the Society of Laryngology of Berlin, DR. GRABOWER presented (*Annales des Mal. de l'Oreille, du Larynx, etc.*, 1894, No. 2) a patient with tabes dorsalis and paralysis of the left recurrent. These lesions were stated to be of central origin; and the absence of any motor impairment of the sterno-cleido-mastoid muscle was urged as a proof that the spinal accessory nerve is not concerned in the motor innervation of the larynx. At the next meeting of the Society, January 12, 1894 (*idem*), Grabower reported that in the interim his patient had died of intercurrent pneumonia, and that at the autopsy an aneurism of the aorta was discovered, which had eroded the first and second dorsal vertebræ and the lower cervical vertebræ. Nothing was amiss with the recurrent nerves. Consequently the paralysis had not been one of central origin, but a peripheric paralysis of the larynx. The intensity of the pulmonary emphysema had rendered the diagnosis of aneurism impossible during life.

At the earlier meeting, Grabower supported his opinion concerning the spinal accessory nerve by the statement that he had found morphological differences in the sensory and motory nuclei of the pneumogastric, and between these and the nucleus of the spinal accessory; and he contended that his view was confirmed by the success of an experiment of Deak, which he had reported with the same result, namely, that he had divided the pneumogastric nerve and had torn away the peripheric end, with resultant degeneration of the motor and sensory nuclei of that nerve while the nucleus of

the spinal accessory remained intact. At the later meeting he exhibited a preparation showing the relations between the roots of the pneumogastric and those of the spinal accessory nerve.

LYMPH FOLLICLES OF THE PHARYNX, LARYNX, AND TRACHEA.

Z. DOBROWLOSKI, in a prize essay (*Pam. tow. lek. Warsc.*, t. lxxvii.; *Internat. Centralbl. für Laryngologie, etc.*, 1894, x., No. 7), describes his researches as to lymph follicles in the mucous membrane of the pharynx, stomach, larynx, trachea, and in those of the vagina. Microscopic examination of the œsophagus in twenty-three human subjects and in eleven animals of different species, led to the conclusion that in the majority of cases there are no lymph follicles in the healthy human œsophagus. In nine specimens affected with chronic inflammation, lymph follicles were observed chiefly in the upper portion and on the anterior surface. They were directly beneath the epithelium, and the excretory ducts of the acinous glands were usually located in the middle of the follicle.

Adenoid tissue was uniformly found in the pyriform sinus, principally in circumscribed small-celled infiltration. In eight cases the congruence of the gland tissue was very similar to that of the tonsils. So the author names it the laryngeal or the pyriform sinus tonsil.

Lymph follicles were found sparingly here and there in the healthy human larynx, and especially in the ventricle, interarytenoid fold, and the petiolus of the epiglottis. Under chronic catarrhal conditions the lymph follicles are rather copious in the same localities.

AMYGDALITHS.

DR. WALTER B. JOHNSON, of Paterson, N. J., reports (*Annals of Ophthalmology, etc.*, 1894, No. 1) an interesting instance of "tonsilliths" expectorated spontaneously at intervals with considerable hemorrhage after each expulsion.

SUPPURATION IN THE MAXILLARY SINUS.

IN an article by DR. MARCEL LERMOYEZ on the treatment of sinusites at Vienna (*Annales des Mal. de l'Oreille, du Larynx, etc.*, 1894, No. 1), the attempt at evacuation by the natural passage is criticised as irrational because the opening is deeply concealed behind the inferior lip of the hiatus semilunaris, and because even though the beak of a syringe be successfully engaged within the orifice it would be extremely difficult to push it on into the cavity of the sinus, inasmuch as the ostium forms a canal directed from above downward and from behind forward—a direction exactly opposite to that of an instrument which has been placed in the middle meatus.

Furthermore, the sinus cannot be thoroughly washed out even when the canula has been inserted, because the passage is too narrow to admit of the discharge of gummous pus; and it has so happened that observers have extracted large masses of congealed pus by way of a large alveolar opening, when lavage by the natural orifice had extruded nothing but the liquid injected returned slightly turbid.

Puncture through the middle meatus is objected to as not only being at too high a level, but as exposing the orbit to the risk of penetration. Puncture through the lower meatus is objected to because the necessary ablutions are very painful and cannot be executed by the patient.

The alveolar puncture is deemed preferable in all cases except where it is necessary to scrape the sinus, and then the sinus should be entered from the canine fossa.

[These are views with which the compiler of these notes is in full accord.]

NASO-MAXILLARY MYXOSARCOMA.

THIS case, observed in a child five years of age, is reported by DR. C. W. RICHARDSON, of Washington (*Annals of Ophthalmology, etc.*, St. Louis, 1894, No. 1). It is unusual, from the extreme youth of the patient whose disease began to attract notice toward the second year of his life. Dr. Richardson removed an extensive growth from the nose and pharynx, using the wire snare and forceps, without anæsthesia—a very wise precaution under the circumstances, although the hemorrhage was far less than is anticipated from malignant growths in this region. Within six days a reproduction of growth occurred almost equal in magnitude to the original mass. Under chloroform anæsthesia Dr. Richardson now exposed the parts from the exterior, and finding the maxillary sinus involved, he removed the bony mass entirely, separating it from the pterygoid process. The cavity was carefully freed from morbid tissue, and was then packed with iodoform gauze; and the integumentary flaps were carefully sutured into proper position. Recovery was prompt and apparently satisfactory. Recurrence took place, however, after an interval of some three weeks, and in five weeks the growth had acquired enormous proportions, filling out the whole cervical region extending from the mastoid process to the clavicle. A smaller growth had become developed on the opposite side just above the clavicle. During the week growths were noted in the lateral walls of the pharynx, and in the left cervical region; but there was not any recurrence in the nasal cavity. Death by inanition and exhaustion ensued four months after the operation.

PLASTIC RECONSTRUCTION OF A VOCAL BAND.

OUR record is copied from the *Internat. Centralblatt für Laryngologie, etc.*, January, 1894, x., No. 7; "Laryngo-fissure, Extirpation, and Plastic Reconstruction of the Right Vocal Band; Recovery." STÖRK performed the tracheotomy and GESURNY the laryngo-fissure. Gesurny cut out the vocal band, partially loosened up the ventricular band, drew it downward, and sutured it so that it formed a substitute for the vocal band, and rendered a good closure of the glottis possible, though it did not participate in the movement. The glottis, however, was rendered narrow. Ten days after the operation the voice was quite loud and tolerably clear, and so remained.

TRAUMATIC EPILEPSY, NASAL IN ORIGIN.

DR. THOMAS J. HARRIS, of New York, reports (*Annals of Ophthalmology, etc.*, 1894, No. 1) a case of traumatic epilepsy traceable to the result of a blow

on the nose, which had fractured the vomer, distorted the perpendicular plate of the ethmoid, and dislocated the cartilaginous septum to such an extent as to shut off all respiration on the right side. After a series of operations for restoration of the respiratory function through the occluded orifice, the patient was freed from his liability to epileptic seizures.

The author refers to a case reported by Dr. S. Weir Mitchell, in *THE JOURNAL*, 1889, in which traumatic epilepsy had been induced by the sojourn of a foreign body in the nose. Complete cure of the fits resulted after removal of a bean, and proper ablutions with astringents.

PARTIAL DESTRUCTION OF THE CARTILAGINOUS TRACHEA, AND STRICTURE THE ENTIRE LENGTH OF THE TRACHEA; RELIEF BY PLASTIC OPERATION.

LARDY and PHOTIADES, of Constantinople, report this unique case (*Rev. Méd. Suisse Romande; Internat. Centralbl. für Laryngol., etc.*, 1894, x., No. 7). The destruction of the trachea in a man twenty-three years of age, otherwise perfectly well, had occurred long ago, and the cause could not be determined. There were no evidences of syphilis, tuberculosis, or other disease. The patient wore a canula, but did not know for what cause tracheotomy had been performed. The compiler of the notes in the *Centralblatt* suggests diphtheria, arguing from the destruction of the walls of the trachea. The cavity of the lower portion of the larynx and of the upper portion of the trachea was filled with granulation tissue.

After splitting the larynx and scraping out the trachea, a tracheal tube of hard rubber was temporarily inserted, over which an anterior flap was adjusted partly of skin and partly of a periosteal flap taken from the right clavicle.

The patient still requires frequent tubage, but breathes comfortably without a canula, speaks with a fairly normal voice, and is fully competent to do his work.

TRANSLUMINATION IN THE DETECTION OF PUS IN THE MAXILLARY SINUS.

DAVIDSOHN, a year or so ago, drew attention to the illumination of the eyeball by incandescence from the electric light in the mouth as a surer indication of freedom of the antrum from purulent products than is incandescence of the cheek over the region of the antrum; and now BURGER contends (*Rev. de Lar., etc.*, 1894, No. 1) that luminous sensations in the eyeball are far more distinctive tests than illumination, as a very feeble light will suffice to excite the subjective sensation.

OSSEOUS OBLITERATION OF THE POSTERIOR NASAL OUTLETS.

IN a rather prolix, though classically arranged paper, MM. HOUGENHEIM and HILARY refer more or less briefly (*Annales des Mal. de l'Oreille, etc.*, 1894, No. 1) to all recorded cases of occlusion of the choanæ which have come to their knowledge, and then detail a case of their own. A girl, fifteen years of age, of characteristic adenoidal expression, was found to have, in addition to her adenoids, a congenital osseous obliteration of the posterior nasal outlet of

the left side. She had been very hard of hearing on this side since her infancy. Some months after removal of the adenoids the obstructing partition was drilled through after unsuccessful attempts at perforation with the electric cautery; the opening was enlarged with the cautery, and then packed with iodoform gauze. There was so considerable a disposition to closure of the aperture that more than thirty subsidiary operative procedures were necessary to combat it successfully. Six months later, the patency had remained constant, with great improvement in the various physical and intellectual functions.

Following this report, the little treatise is continued in a systematic summary containing the gist of all that has ever been written upon the subject and the conclusions to be derived therefrom.

A RARE VARIETY OF NASAL MYXOMA.

DR. LUC reports (*Arch. Internat.*, No. 6) the case of a man, twenty-eight years of age, who had a growth completely obliterating the left nasal passage. Though it resembled an ordinary polyp it bled profusely at the slightest touch. With considerable difficulty it was eventually removed, practically by evulsion with a double curette passed beneath it, and the hemorrhage was so profuse as to produce demisyncope. The growth was of the size of a large prune, and of irregular configuration, defying all comparison. A detailed account of the histological investigation is given, illustrated by a number of woodcuts.

It appeared to be an inflamed myxoma in way of active sarcomatous transformation.

SARCOMA OF THE TONSIL.

THE case was reported to the Société de Chirurgie, November 28, 1893 (*Universal Medical Journal*, January, 1894). A young man had suffered for three or four months with an indolent enlargement of the tonsil, which had acquired the bulk of a large mandarin orange, and had invaded the soft palate, the wall of the pharynx, and the base of the tongue. It was safely removed as follows, with satisfactory results and without inflammatory sequence:

The tissues of the cheek, from the commissure as far back as the perpendicular ramus, were incised along the lower edge of the maxillary bone, and dissected off, leaving the mucous membrane of the mouth undisturbed for the time being. The flap was dissected upward, exposing the submaxillary region, from which the ganglia and submaxillary gland were then removed. The external carotid was ligated, though with difficulty, and it is to this feature of the procedure that the freedom from subsequent inflammation was attributed. Then the mucous membrane still adherent to the jaw was severed and turned upward, exposing the tumor freely when the mouth was widely opened. The palatine and pharyngeal attachments were severed with the thermo-cautery, but it was necessary to remove a large portion of the tongue in order to include the lingual contingent of the neoplasm. The parts were then brought together and dressed. Solutions of chloral were used daily as an antiseptic, and in twenty days the patient was discharged entirely cured.

SARCOMA OF THE NOSE.

DR. ONODI, of Budapest, reports (*Rev. de Lar., etc.*, 1894, No. 1) a case in a man fifty years of age. The disease began early in 1888 as one of multiple bilateral benign polypi, with recurrence toward the close of the year in a mixture of growths benign and malignant in one passage only. Evulsion of the growths and igneous cauterization of the suspicious places procured uninterrupted relief for ten months. Eleven months later one side of the nose was filled up again with growths, this time exclusively sarcomatous; the other side remaining entirely free of them. The nose was resected, and complete extirpation practised, including the turbinate bodies. Suppuration was found involving the lacrymal sac, the frontal sinus, the sphenoidal sinus, and the ethmoidal cells; all which parts were thoroughly cleansed.

The patient has been doing well ever since.

EPITHELIOMA OF THE LARYNX.

DR. SEMON reports (*Journ. Lar., etc.*, 1894, No. 1) an instance of coexistence of epithelioma and of papilloma in several specimens from a growth, and without any evidence of transition into the one from the other. It is the case of pedunculated angioma reported by Semon and Shattock in the *Trans. Path. Soc.* of 1891.

Four months and a half later recurrence of undoubted epitheliomatous nature took place; and so the basis of the growth was entirely removed through the incision of sub-hyoid pharyngotomy. On the third day after the operation the patient suddenly became comatose, the temperature rose to 107°, and death ensued twenty-four hours later. No clue to the cause of coma and the fatal issue could be determined at the post-mortem examination. The case is important as the first known instance of malignant disease of the larynx beginning in a pedunculated angioma.

THYROIDAL GROWTHS PENETRATING INTO THE AIR-PASSAGES.

DR. SEMON has called the attention of the Laryngological Society of London (*Journ. Lar., etc.*, 1894, No. 1) to the tendency of infiltrating malignant disease of the thyroid gland to become pedunculated when perforating into the large air-passages. [Is there a sort of wire-drawing process permitting the freed portion to expand while the incarcerated portion remains constricted?—Compiler.] The fact was illustrated first by a specimen of cylinder-celled carcinoma from a man thirty-nine years of age, whose case had been reported in the *Trans. Path. Soc.* for 1888. A second specimen was one of epitheliomatous disease, in which pedunculated projections repeatedly grew into the trachea. One of these projections had apparently completely sloughed away.

INVERSE ACTION OF THE VOCAL BANDS.

DR. MAX SCHEIER, of Berlin, in an article on this subject published in the *Arch. Internat. de Laryngologie, etc.*, No. 6, reports a recurrent instance in a female operative forty-three years of age. On a number of occasions,

some of them while in the hospital under treatment for non-laryngeal disease, she had been suddenly seized with asphyxiative dyspnoea of such intensity as to have apparently demanded tracheotomy. Sometimes these paroxysms had subsided as suddenly as they had commenced; sometimes slowly; sometimes with recurrence on exertion during periods of several continuous weeks. When, under laryngoscopic inspection, the patient attempts to take a deep inspiration, the vocal bands become pressed together so as to completely close the glottis anteriorly, the right vocal band sometimes crossing on top of the other one; but there remains a triangular opening posteriorly, due to persistent paresis of the transverse muscle. During sleep respiration is performed in a normal manner. All treatment attempted, topical and constitutional, has failed to be of any service whatever.

COMPRESSION OF THE TRACHEA.

MR. BERNARD PITTS records in the *Lancet*, No. 3654, an instance of a bronchocele of eight years' standing compressing the trachea of a lad fifteen years of age, who was brought into St. Thomas's Hospital cyanosed and insensible from intense dyspnoea. Mr. Pitts tried to relieve the labored respiration by venesection from the external jugular vein; and failing, succeeded in opening the trachea and in re-establishing respiration by artificial means. On account of hemorrhage and disturbance to the thyroid gland, that structure was removed. Although the patient did well for twenty-four hours, he died two days later from broncho-pneumonia. The record is accompanied with an illustration of the anatomical condition of trachea and surrounding structures.

DOUBLE NOSE WITH TWO CARTILAGINOUS SEPTA AND THREE NARES.

THE case is reported and depicted (*Rev. de Lar., d' Otol., etc.*, 1894, No. 1) by DR. E. BAUMGARTEN, of Budapest. The supernumerary orifice is irregular in outline and is located above the normal nares and in the middle line. This anomaly of development is regarded as similar to that by which hare-lip is produced. The patient was but eight weeks old when the case was reported, and at some future date an attempt will be made to correct the deformity.

ARGYRIA FROM SILVER NITRATE.

DR. ONODI, of Budapest, reports (*Rev. de Lar., d' Otol., etc.*, 1894, No. 1) an instance in a syphilophobic man sixty-two years of age, who, for some ten years, had pencilled his throat every two or three days with a very strong solution of silver nitrate made in a rule-of-thumb way from the crayon. About five years ago the face and brow began to get gray. At present the discoloration is pronounced in the brow and face; the lips are gray, the teeth black, the gums gray over their entire extent and with a black border close to the roots of the teeth, the inferior surface of the tongue is gray, the soft and hard palate are grayish, and the pharynx is of a pronounced gray. The larynx is not discolored.

Dr. Onodi had also reported (*Monatsh. f. Ohr., etc.*, 1888) a case of argyria

in a man with cancer of the larynx, due to inhalation of a 10 per centum solution of silver nitrate during some three years. The case is described with its autopsy and microscopic examinations. Even the choroid plexus had become completely blackened.

SUPPURATION IN THE MAXILLARY SINUS.

DR. H. BURGER, of Amsterdam, records (*Rev. de Lar., d'Otol., etc.*, 1894, No. 1) two interesting cases of suppuration in one maxillary sinus, with purulent rhinitis in the posterior portion of the nasal passage upon the opposite side. This he accounts for by the transfer of the products of suppuration from the diseased sinus out of the nares posteriorly and into the other around the septum, while the patient is lying at night on the sound side. He therefore deems it a duty in every case of unilateral rhinitis to entertain the possibility of suppuration in the maxillary sinus of the opposite side.

OBSTETRICS.

UNDER THE CHARGE OF

EDWARD P. DAVIS, A.M., M.D.,

PROFESSOR OF OBSTETRICS AND DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC;

CLINICAL PROFESSOR OF DISEASES OF CHILDREN IN THE WOMAN'S MEDICAL COLLEGE;

CLINICAL LECTURER ON OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE;

VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.;

ASSISTED BY

WILLIAM H. WELLS, M.D.,

ASSISTANT DEMONSTRATOR OF CLINICAL OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE,

PHILADELPHIA; CLINICAL ASSISTANT TO THE CHAIR OF OBSTETRICS AND

DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC.

BILATERAL FACIAL PARALYSIS DUE TO INJURY BY FORCEPS AT BIRTH.

EDGEWORTH (*British Medical Journal*, 1894, No. 1723). The patient, when shown before the Bristol Medico-Chirurgical Society, was seven years old. From birth she had suffered from bilateral facial paralysis. Expression lines were absent. The child could not frown or raise the eyebrows, but could partially close the eyes by relaxing the levatores palpebrarum; there was no movement of the orbiculares oculorum. The lower lids were very thin, with an upper border more concave than normal, slightly dropping away from the eyeballs. No movement of the ear, nose, or cheek muscles could be found. On testing the patient's speech it was found that she could pronounce labials, though not very distinctly, but labio-dentals with more difficulty, and there was a tendency to replace the latter by anterior-palato linguals. The bones of the face were well developed. There was no deafness, no evidence of otitis media or loss of taste. The palate moved well. No response to either the constant or interrupted current could be obtained. The mother gave a history of a long labor, lasting three days with a difficult forceps extraction. The author considers the case to be one of double peripheral facial

paralysis, complete in the upper part of the face, but incomplete in the lower portion, and due to forceps pressure at birth. The good development of the facial bones is an interesting feature, as the facial nerve is not supposed to supply these structures.

SYMPHYSIOTOMY.

PINARD (*Annales de Gynécologie*, January, 1894), reports the histories of 13 cases of symphysiotomy in the clinic of Baudelocque during 1893. Of the above cases, 9 were multiparæ and 4 primiparæ. Regarding the deformity for which operation was done, 10 had rhachitic and 3 generally contracted pelves. Twelve of the mothers lived, and one died. The children (thirteen) all lived. No accidents were encountered during the operations, although many of the patients had bad obstetric histories. Hemorrhage, other than that occurring at the time of section of the symphysis and subpubic ligament, was easily controlled by a tampon. Twice during the extraction of the fœtus a tear occurred in the anterior vaginal wall, making this canal communicate with the field of operation. All these tears were in primiparæ. A vaginal tampon of iodoform gauze was sufficient to produce primary union in both.

In one case there was a lesion of the bladder, resulting in a vesico-vaginal fistula. A pelvic deformity complicated with ankylosis of the right inferior extremity formed an unyielding point against which the bladder, during extraction of the fœtal head, was pushed. The patient recovered.

In one case there was incontinence of urine, which existed some days after delivery. No injury to the bladder was present. The trouble yielded later to electricity.

The only fatal termination was in a case with contracted pelvis. Liquor amnii was fœtid. Notwithstanding antiseptic treatment to uterus and vagina, the woman died on the ninth day of septicæmia produced by staphylococci. The child lived.

Experience has shown the author that it is well, particularly in primiparæ, to dilate the birth canal by means of the balloon of Champetier de Ribes before section of the bony pelvis, and to avoid tearing the soft parts of the mother at the moment of birth; the danger of the latter being considerably reduced by practising the precaution (indicated by Varnier) of adducting the legs when the head is engaged. In cases where the head is very high, the author considers it preferable to aid the engagement of the head when in the grasp of the forceps by pressure over the abdomen rather than to let it engage alone.

In closing his report, Pinard draws the following conclusions:

1. Induced labor should be abandoned in all cases in which symphysiotomy permits the passage of the head of a fœtus at term.
2. Abandon all applications of the forceps where osseous resistance exists, either at the superior strait, in the pelvic cavity, or at the inferior strait.
3. Embryotomy on the living infant must be absolutely abandoned.
4. The pelvis should be enlarged temporarily by symphysiotomy, pubiotomy, ischio-pubiotomy, or coccygotomy in all cases in which osseous resistance is not conquered by the head well flexed and when calculations demonstrate that section of the pelvis will permit the passage of the head.

5. Amputation of the uterus and ovaries in cases of complete pelvic narrowing.

He abandons all applications of the forceps at the superior strait because of the danger of fracture of the foetal skull.

Induced labor he abandons, because in many cases infants are born which are not viable, the operation frequently comes too late, and (a point to which he calls special attention) the most recent investigations of neuropathologists have demonstrated that an infant born with difficulty before term may be affected with cerebral diplegia.

A CASE OF RUDIMENTARY BICORNATE UTERUS WITH DEFICIENT VAGINA.

BEUTTNER (*Centralblatt für Gynäkologie*, 1893, No. 49) reports in detail a case coming into the service of the University Frauenklinik at Bern. The patient was eighteen years old, and had a somewhat tuberculous history. There was amenorrhœa without vicarious hemorrhages of any kind. Considerable pain had existed for some time in the sacral region, so that walking was impossible. The vagina existed only as a narrow slit. Examination per rectum and externally by the abdomen detected the absence of the uterine body, and on opening the abdomen the following interesting condition was found: The uterus was represented by a band two centimetres broad, extending across the pelvis and covered by peritoneum which was reflected from the vagina and rectum. The right ovary was enlarged. Both ovaries, tubes, and the horns of the uterus were clamped with forceps and removed, the stumps being treated with the thermo-cautery. A parovarian cyst the size of a cherry, associated with a daughter cyst, was found.

A longitudinal section of the enlarged ovary showed three cysts containing a yellow serous fluid and blood. The ovarian tissue was infiltrated with yellow serum, and upon its upper surface follicles filled with dark-red blood could be seen.

The right uterine stump contained evidences of a cavity. No trace of the round ligaments could be found. It was impossible to tell exactly how far apart the uterine horns had been in the pelvis, because they were drawn from their original position during the exploration.

On microscopic examination the tissue of the rudimentary uterus was found to be normal, with rich development of muscular tissue, the muscle bundles alternating with small septa of connective tissue.

NORMAL PREGNANCY AND DELIVERY AFTER VAGINO-FIXATION.

DÜHRSEN (*Centralblatt für Gynäkologie*, 1893, No. 49) reported at a meeting of the Gesellschaft für Geburtshülfe und Gynäkologie, Berlin, October 27, 1893, the subsequent history of a patient upon whom, in November, 1891, he had performed vagino-fixation. The patient recovered perfectly from the operation, conceived one month later, and was delivered of a healthy child. During the pregnancy the uterus remained in a state of normal ante flexion, and the period of gestation was in every way uneventful. Examination after delivery showed the uterus in a state of physiological atrophy, small, ante flexed, and perfectly movable.

A CASE OF SELF-ABORTION.

GOENNER (*Centralblatt für Gynäkologie*, 1894, No. 3) reports a case of a woman, thirty-seven years old, who had given birth to four children at term, and committed abortion on herself three times. Believing herself to be pregnant she inserted an elastic catheter into the vagina. The operation caused considerable pain, and on withdrawing the catheter some hemorrhage occurred. It was also found that a part of the catheter remained behind. An attack of peritonitis followed, and abortion occurred five days after the insertion of the instrument. Six days later, during defecation, the patient was seized with severe pain in the lower part of the abdomen and ileo-cæcal region. No trace of the piece of the catheter could be found by palpation, and operative procedures were considered, when the fragment was passed in a fecal evacuation. No trace of a puncture of the vagina could be found. The patient eventually recovered.

THE CROCHET IN NEGLECTED SHOULDER PRESENTATIONS.

HEINRICIUS (*Nouvelles Archives d'Obstétrique et de Gynécologie*, 1893, No. 7) reports his experiences with Braun's crochet as follows: He considers the instrument to have many advantages. Cutting instruments are dangerous by reason of the facility with which they can wound the uterus and the surgeon. Those in the form of scissors, render the decapitation relatively longer, and one can easily cut the fingers of the hand which exercises traction on the neck. Ecraseurs, articulated saws, and other similar instruments are too complicated, and it is difficult or impossible to apply them. This crochet of Braun is simple, solid, cheap, easy to clean, and without danger to the patient; ordinarily easy to apply and rapid in execution.

The author also includes an accurate description of the instrument.

PARTURITION IN YOUNG WOMEN.

MUNDER (*Archiv für Gynäkologie*) records his investigations conducted in the Frauenklinik at Bern, from 1872 to 1891, upon the proportion of births occurring in the earlier years of life, and the results of the same. 493 cases were chosen, the limit of age being twenty years. His conclusions may be summed up as follows:

1. Menstruation occurred in most cases at a somewhat earlier age than that commonly reported.
2. The greater proportion of births have a favorable ending.
3. Generally contracted pelves are more frequent in the earlier years, and it is concluded that frequently the bony pelvis is fully developed about the twentieth year.
4. Vertex and face presentations are more frequent, pelvic presentations more rarely seen than in general.
5. The average duration of the period of birth is from two to three hours longer in primiparæ, and decreases gradually toward the twentieth year.
6. Eclampsia, weak pains, and other complications the author finds are not more frequent in primiparæ, and he does not find the forceps more fre-

quently needed; on the other hand, however, perforation was necessary more often, on account of the greater frequency of generally contracted pelves.

7. Lacerations of the perineum are more rare in young primiparæ because of episiotomy, the gradual advancement of the birth, and the greater elasticity of the soft parts of the birth canal. This is plain when contrasted with the condition in old primiparæ. Episiotomy is necessary generally in very young primiparæ with narrow rima.

8. The number of female births was found to be relatively greater than of male.

9. The younger the mother, on the average, the smaller the child.

10. Premature births occurred most frequently when the mother was young.

11 and 12. The proportion of living children was favorable, and the course of the puerperal period good, when the mother was very young.

THE ORIGIN OF PUERPERAL OSTEOMALACIA.

LÖHLEIN (*Centralblatt für Gynäkologie*, 1894, No. 1), after reference to the teachings of Kehrer regarding the parasitic origin of puerperal osteomalacia, inclines to the opinion that the disease may originate through the operations of the bacteria of bone-pus, and relates a clinical case of a woman in her fourth pregnancy who had suffered relapses of the disease after each gestation. Warm salt-baths and cod-liver oil had been tried without avail, and finally Porro's operation was done in her behalf. During the operation a piece of bone the size of a bean was excised from the right iliac crest, which was much softened; it was placed in meat peptone-glycerin agar for cultures. The plate was incubated at a temperature of 37° C., and remained sterile, while two control plates of the same culture media inoculated with pus showed plentiful colonies of staphylococci after forty-eight hours.

Microscopical investigation made on sound sections of the somewhat atrophied ovaries gave negative results. Stainings with Gram-Weigert, Löffler's methyl-blue, carbol-fuchsin, showed micro-organisms to be present. The patient seemed but slightly benefited by the operation, and could walk but feebly at the end of the fourth week, the pain continuing. The author agrees with Winckel in believing that the period of convalescence of these cases requires at least one year.

THE DEVELOPMENT OF THE PELVIS IN BOTH SEXES.

KONIKOW (*Archiv für Gynäkologie*, Band xlv., Heft 1) has made the development of the pelvis of both sexes the subject of an exhaustive series of measurements extending from birth to the twentieth year. His investigations were carried on in the Geburtshülffich-Gynäkologischen Klinik at Bern. After reviewing the opinions of Duncan, Schroeder, Fassbender, and many others, he concludes that every period of life has its peculiar and appropriate force, which affects the development of the pelvis, and that the forces vary in grade and strength in each period of life so as to be easily recognized.

During the first period, in which he classes children of both sexes from birth to the end of the fifth year, the greatest influence is the internal energy of joint growth, and no pressure is exercised upon the sacrum. From the second to the fifth year this pressure of the body weight on the sacrum first appears,

but until the tenth year remains influenced by external conditions. From the tenth to the eleventh year the pelves of both sexes exist under the same influences, and in the sexual sense there is little difference between them. First, during the tenth or eleventh year, the female pelvis begins to prepare for its future task, and is gradually made greater than the male in all its dimensions. At the time of the beginning of ovulation and menstruation it can be easily distinguished from the male.

At the nineteenth or twentieth year the male pelvis is equal or greater than the female in the transverse diameter, but the latter has much the greater measurement in the diagonal conjugate.

THE VAGINAL SECRETION OF PREGNANT WOMEN.

KÖNIG (*Centralblatt für Gynäkologie*, 1894, No. 1) after reference to the investigations of Döderlein, Winter, Steffek, and others, who claimed to have found pathogenic micrococci, particularly the staphylococcus albus and aureus, as well as other pus-producing microbes, in the vaginal secretion of women after labor, relates the results of his own experience in one hundred cases of women aseptic at the period of labor. He claims to have found in the lochia the streptococcus most frequently, and but seldom the staphylococcus aureus, and never the staphylococcus albus. After considering minutely the reaction of the vaginal secretion, which in three hundred pregnant women he found to be distinctly acid, he concludes that in pathological conditions the secretions attain a much higher degree of acidity, so that the streptococcus pyogenes can hardly thrive therein; at least he was unable to obtain cultures of this germ. The author further concludes that the vaginal secretion of every untouched pregnant woman contains nothing pathogenic, the thrush or gonococcus germ excepted. Both are bacteria which upon the usual media of culture are aerobic at the body temperature. The vagina of every untouched pregnant patient is therefore aseptic.

Vaginal injections of antiseptics he considers dangerous in the ordinary patient, as they may chemically lessen the resistance of the tissues to bacteria, and may increase the intensity of septic endometritis by washing bacteria into the uterine cavity.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

INFUSION OF SALT SOLUTION IN INTRA-PERITONEAL HEMORRHAGE.

DÜHRSEN (*Deutsche med. Wochenschrift*, 1894, Nos. 2 and 3) claims that in cases of intra-peritoneal hemorrhage from ruptured ectopic gestation, before the abdominal cavity is opened, a subcutaneous injection of salt solution will, as a rule, promptly revive the patient, so that abdominal section can be

performed. If neither the injection nor the intra-venous infusion of saline solution improves her condition, coeliotomy offers no prospect of cure. The writer uses an ordinary irrigator and aspirating-needle, and injects as much as a litre of the solution between the shoulders. He reports nine cases of coeliotomy for ruptured tubal pregnancy with one death, and refers to twenty others in which Gusserow operated with only two deaths.

RESULTS OF REMOVAL OF THE ADNEXA.

SCHAUTA (*Deutsche med. Wochenschrift*, 1894, No. 5) reports 216 cases, with a mortality of 6 per cent., two deaths being from pneumonia. In 144 cases no pus at all (or else sterile), was found in the tubes; in 73 it was sterile, contained no streptococci. In the former the mortality was only 2.8 per cent., in the latter 9 per cent. In 15 cases pus tubes were removed containing staphylococci, with a mortality of 20 per cent. The after-histories of 121 patients were obtained, from which it appeared that 100 were in perfect health, free from pain, with no return of the menses in most cases, and able to attend to their work; 17 patients were relieved, but had occasional pains and irregular hemorrhages. The writer infers from these facts that it is not proper to class all operations for removal of the adnexa under one category, since they differ widely according to the contents of the tubes. It is fair to infer that the results of the operation will be still better in the future.

OVARIAN CYSTS COMMUNICATING WITH THE RECTUM.

CRIPPS (*Brit. Med. Journ.*, Feb. 10, 1894) met with four instances of this complication in one hundred cases of ovariectomy. In discussing the question of treatment, he calls attention to the difficulty of diagnosis, where it was not positively known beforehand that a cyst was present. When there is a distinct swelling in the posterior vaginal fornix in connection with a rectal fistula, it seems preferable to puncture and drain *per vaginam*, as was done successfully in his first case. In two others, since the fistula could not be reached *per rectum*, it was deemed best to open the abdomen, and to reach and suture the opening from above, which was effected with success. In the fourth case (fatal), a broad-ligament cyst communicated with the rectum, and was drained through the lower angle of the wound. The writer properly states that it would have been preferable to unite the edges of the broad ligament and to have drained the cavity left after enucleation of the cyst into the rectum.

GLANDULAR ELEMENTS IN FIBRO-MYOMATA.

SCHOTTLÄNDER (*Zeitschrift für Geb. und Gyn.*, Bd. xxvii.) found in an isolated fibro-myomatous nodule, situated on the exterior of a larger growth, glandular formations, closely resembling the glands of the endometrium, while the tissue in their immediate vicinity presented the same structure as the sub-mucosa. The writer explains the presence of these glands on the theory that when a myoma develops in the uterine wall it acts as an irritant both to the endometrium and to its glands; the latter proliferate and extend from their original site to the tumor. It may be that small subperitoneal myomata were

originally submucous, and that endometritis may be the initial factor in the causation of these as well as of the larger tumors.

SURGICAL TREATMENT OF PRURITUS VULVÆ.

SÄNGER (*Centralblatt für Gynäkologie*, 1894, No. 7) concludes an extended article on the subject of *vulvitis pruriginosa* as follows: 1. In intractable cases of pruritus vulvæ, partial or total excision of the vulva is a justifiable operation. 2. The removal of the glans clitoridis and prepuce in older women is a proper procedure, since the changes in the nerve-endings due to the disease are such as to destroy the ordinary sexual irritability. 3. In younger subjects, and when the disease is more limited, a partial operation should be done. 4. In older patients, where the affected surface is extensive, the entire vulva should be excised, and the gap closed by a plastic operation.

ALUMINOL IN GYNECOLOGY.

HEINZE and LIEBRECHT (*Berliner klin. Wochenschrift*, 1892, No. 46) commend highly this new salt of aluminium as a combined astringent and antiseptic, especially when injected into abscess cavities, which rapidly diminish in size under its use. In gonorrhœal endometritis it acts well, destroying the cocci in the depths of the tissues, when used in pencils (2 to 5 per cent.); in a strength of 10 to 20 per cent. it has a decided caustic action. It is also a valuable remedy in non-specific vaginitis when used in $\frac{1}{2}$ or 1 per cent. solution.

VAGINAL HYSTERECTOMY FOR DISEASE OF THE ADNEXA.

SEGOND reports twenty-two operations during 1893, without a death; in four cases there were purulent foci in the pelvis, in six uterine fibroids as well as double salpingitis. The steps of the operation, as he performs it, are as follows: 1. Curettage after dilatation of the cervical canal. 2. Circular incision of the vaginal fornix and dissection of the cervix as high as the peritoneum in front and behind. 3. Clamping and separation of the bases of the broad ligaments. 4. Median section of the uterus and delivery of each half by forcible traction with volsellæ. 5. Clamping and division of the upper portions of the broad ligaments. 6. Tamponade of the vagina with iodoform gauze. The operation is simple and bloodless; the forceps (from four to six in number) are removed at the end of forty-eight hours.

TREATMENT OF LARGE VESICO-VAGINAL FISTULÆ.

MACKENRODT (*Centralblatt für Gynäkologie*, 1894, No. 8) describes his method of dealing with large fistulæ as follows: The anterior vaginal wall is put on the stretch by traction on the portio and the urethro-vaginal septum below the fistula, any cicatricial bands being divided. The bladder is also dissected off from the uterus as high as possible. A median incision is made through the vaginal mucosa, between these two points, and in a line with the middle of the fistula; the edges of the latter are then split and the anterior vaginal wall is dissected off from the bladder as in vaginal fixation

of the uterus. The edge of the fistula is denuded, and the opening in the bladder is closed with sutures of silkworm-gut; if necessary a second layer can be introduced in order to fold-in the redundant bladder wall. The corresponding edges of the vaginal opening are then denuded, the fundus uteri is drawn downward as in vaginal fixation, and is united to the flaps of the vaginal wound, thus blocking the opening.

The after-treatment consists simply in vaginal douches, the patient being allowed to pass her urine if she can. The sutures in the bladder come away of themselves without causing any irritation; the vaginal wound heals rapidly by granulation. The same method is followed in the case of utero-vesicovaginal fistulæ, the opening in the uterus being closed by catgut sutures after the bladder has been dissected away.

The writer proposes this operation as a substitute for the more severe abdominal method of closing complicated fistulæ, or for colpocleisis, and believes that with it no case should be regarded as incurable.

PÆDIATRICS.

UNDER THE CHARGE OF

LOUIS STARR, M.D.,

OF PHILADELPHIA;

ASSISTED BY

THOMPSON S. WESTCOTT, M.D.,

OF PHILADELPHIA.

INDICANURIA IN CHILDREN; ITS VALUE AS A SIGN OF TUBERCULOSIS.

SEVERAL months ago (*American Journal of the Medical Sciences*, July, 1893, p. 123) we gave an abstract of the study of Voûte, of Amsterdam (*Revue mens. des Maladies de l'Enfance*, 1893, p. 49), upon this subject, to which attention is again called by a very recent paper by M^{lle}. LIUBITZA DJOURITCH (*Revue mens. des Maladies de l'Enfance*, February, 1894, p. 49). After reviewing the studies of Hochsinger and Kahane, and the opposing results of Steffen, Voûte, and Carlo Giarre—to all of which, except the last, reference has been made in the abstract of Voûte's paper—the author proceeds to give the results of her own study on the subject. She criticises the conclusions reached by Steffen, by using Jaffé's method, as imperfect, for the reason that when there is in the specimen of urine a very small quantity of indican, a slight excess of the solution of calcium chloride destroys a part of the coloring matter, possibly enough to make the test appear negative; and moreover, when a fresh specimen is treated by this method a series of organic and inorganic compounds are produced by the addition of chloroform, resulting in a clouded emulsion of a very pale blue or a reddish-violet tint that cannot be determined by colorimetric tests. The test adopted for the investigation

was as follows: Equal parts of urine and hydrochloric acid are mixed in a test-tube, and then chloroform added and the mixture shaken for a moment. The presence of indican is shown by a violet coloration of the chloroform, the intensity varying according to the proportion of indican present.

Fifty-one cases were examined, and with each subject the examination was repeated several times. The absence of indicanuria in healthy children was confirmed. Its presence was detected, but inconstantly, in the following affections: typhoid fever, perityphlitis, chronic gastro-intestinal dyspepsia, bronchitis, pneumonia, pleurisy, and grave chorea. In the acute diseases above mentioned indicanuria existed very markedly during the febrile stage, but disappeared at the moment of defervescence, and did not reappear during convalescence. In tuberculosis, on the contrary, the presence of indican was constant: in one case of a little girl, rhachitic and tuberculous, it was found in decided quantity at every daily examination for a month preceding death. In another observation (pulmonary tuberculosis and purulent pleurisy in a child of two years) the daily quantity varied, but it was never entirely absent.

The conclusions from the study are given as follows:

1. Indican exists in normal state in the urine, but in so small a quantity that indicanuria must be considered as a pathological phenomenon, especially with children whose diet is less nitrogenous than that of adults.
2. Indican being a derivative of indol, indicanuria will be especially accentuated in diseases accompanied by an over-production of indol.
3. This over-production is especially encountered in acute and chronic diseases of the digestive tract.
4. Indicanuria is constant and permanent in tuberculosis, according to the author's experiments. It seems, therefore, that there exists a direct relationship between indicanuria and tuberculosis.
5. The explanation of indicanuria in tuberculosis is difficult when there exist no digestive troubles. Up to a certain point it can be explained by the profound depression of general nutrition manifested in the course of tuberculosis.

SOME FATAL AFTER-EFFECTS OF CHLOROFORM ON CHILDREN.

LEONARD G. GUTHRIE (*Lancet*, January 27, 1894, p. 193) makes some valuable observations under this heading. As a rule, he says, children pass from chloroform narcosis into a condition of deep natural sleep, which lasts for an hour or more unless disturbed by pain or vomiting. No attempt to rouse the patient should be made unless collapse is present, or the breathing becomes stertorous and the face dusky. He should be put to bed with as little disturbance as possible. The bed should be previously warmed by hot-water bottles. The room should be kept quiet, dark, and cool. The patient's head should be turned on one side on a low pillow, and he should be carefully watched, for accidents—such as the entry of vomit, or falling back of the tongue into the glottis—are as likely to happen now as during the operation. . . . Vomiting, though usual, is not invariable. Some children, even after prolonged operations, vomit little or not at all, and as soon as awake they begin to clamor for food. . . . Vomiting, unless frequent, persistent, and exhausting, after six or eight hours have elapsed, need not be checked

by drugs. Simple remedies, such as sipping very hot water out of a feeder or sucking small pieces of ice, which most children like, usually suffice. . . . If, after from six to eight hours, vomiting shows no tendency to subside, and no nourishment can be kept down, it is necessary to feed by nutritive enemata. . . . The common formula used is half a drachm to one drachm of strong meat essence and the same quantity of brandy, with a raw egg beaten up in half an ounce of peptonized milk. . . . Children often on regaining consciousness commence to utter piercing cries, and continue to do so for many hours. In many cases this is due to pain, or to a tight bandage, or to a constrained position; but often no obvious cause can be detected. . . . Occasionally screaming and vomiting become symptoms of the gravest import. Ten such cases are discussed in this paper. The condition in these cases resembles that of acute delirious mania. Shrill, piercing screams are uttered at short intervals. The eyes are dry, the pupils often dilated; the face is sometimes flushed, sometimes pale, and has a look of wild terror and anxiety. There are almost always great restlessness and sleeplessness, the patient tossing and struggling. Consciousness is sometimes lost early, and in some cases is never regained; but, as a rule, there are intervals in which the child appears to be dull and apathetic, yet answers rationally and denies pain. Sometimes, also, in the height of excitement it may be soothed for a time, but the screaming will soon recommence. Headache does not seem to be present. Grating of the teeth has occasionally been observed, and in one case the pupils were unequal shortly before death. Strabismus has been absent. Vomiting of an extremely violent, copious, and persistent type is an all but invariable symptom. Not only is food given by the mouth almost immediately returned, but the vomiting occurs when the patient is fed entirely by the rectum. The vomit at first, when the stomach is empty of food and when there are intervals in the attacks of vomiting, is clear or yellowish, but usually exactly resembles the dregs of beef-tea, and answers to Gmelin's test for bile. . . . The temperature generally falls to 97° or 98° F. immediately after the operation. A temperature of from 95.8° to 96° was noted in only one case, and this was the only one of the ten that recovered. The temperature usually undergoes several moderate rises and falls, and is commonly above normal at death. In one case it rose to 103° four hours after operation and remained so throughout. Death, as a rule, is owing to gradual exhaustion; the screams become less powerful and are uttered at longer intervals; the vomiting is less violent; unconsciousness leads to coma; respiration and pulse gradually fail, the latter often being imperceptible for a considerable time before the breathing ceases.

THE ACTION OF LIGHT UPON THE KLEBS-LÖFFLER BACILLUS.

AN important bacteriological study upon this subject by LEDOUX-LEDARD (*Revue mens. des Maladies de l'Enfance*, February, 1894, p. 66) leads him to the following conclusions:

The action of diffused light does not prevent the development of cultures of diphtheria either at 90° to 95° F. or at ordinary temperatures. Sunlight arrests this development and sterilizes bouillon cultures in several days.

Diffused light has no bactericidal power over the bacillus in dilution in

neutral bouillon; but, on the contrary, this power is great in dilutions in distilled water, the latter acting in the same way as light, and the destructive action upon the bacillus being the resultant of the two concordant actions.

Diffused light destroys dry cultures of the bacillus, when exposed in thin films, in less than two days (twenty-four hours of exposure to the light). Direct sunlight acts in the same way, but with greater rapidity.

This bactericidal power of light toward the bacillus of diphtheria is due almost exclusively to the rays of greatest refraction; rays at the other extremity of the spectrum have little or scarcely any power. Light, therefore, is to this extent a prophylactic against diphtheria.

In exposed diphtheritic false membranes light does not reach the bacilli until it has lost all or part of its intensity, hence they preserve their vitality and virulence for a long time.

Light can be utilized in the disinfection of places infected with diphtheria, but only as an auxiliary to more certain disinfectants.

SCURVY IN CHILDREN.

At a stated meeting of the New York Academy of Medicine, February 15th, DR. W. P. NORTHRUP (*Archives of Pediatrics*, March, 1894, p. 227) read the paper on this subject. The disease is described as a condition of malnutrition which affects the capillaries, allowing the blood to escape from the vessels, producing gingivitis or spongy gums, and various hemorrhages. The collections of blood in the tissues are most apt to be about the shaft of the femur and beneath the periosteum, and into the skin, forming spots of ecchymosis or petechiæ. Epistaxis and hemorrhages from other mucous membranes are not uncommon. There is also anæmia, and points of tenderness, notably about the swollen limbs. Dr. Northrup had succeeded in collecting eleven cases of infantile scurvy from American practice. On analysis all gave the same history—feeding on proprietary food, feeding by paid nurse, or on food consisting of condensed milk. In one case scraped meat had been advised by a physician for persistent diarrhœa, and as the baby got well on this diet the parents continued it for months, with the result of developing scurvy. The disease is more apt to occur among the well-to-do, for the reason that they are better able to pay for proprietary foods, and their children are less likely than those of the poor to have the freedom of the table. Statistics showed that the age at which the disease was found most typical was the second year. Scurvy is frequently associated with or superadded to rickets. The treatment is orange-juice and other fresh fruits, with change and regulation of the diet.

DR. H. L. TAYLOR continued the discussion by describing a case which had been referred to in Dr. Northrup's paper. The child was eleven months old, and had been fed exclusively on a special brand of condensed milk. She had seemed to thrive on this food up to the age of six or seven months, when it was noticed that she could not sit up as she had done before. The other typical symptoms soon became manifest. A point in differential diagnosis was the fact that there was no local elevation of temperature in the swollen thighs, as would be the case with rheumatism and other inflammations.

DR. LOUIS STARR, of Philadelphia, in a communication, stated that he

had seen thirteen cases of infantile scurvy, nine of them since 1891. Immobility and excessive tenderness of the lower limbs, with swelling most pronounced in the neighborhood of the joints; spongy gums, and sometimes hemorrhages, were the most characteristic symptoms. All his cases recovered under proper dietetic treatment, together with orange-juice. Several of his cases he attributed to the use of sterilized milk, from the fact that these children recovered as soon as the administration of this milk was discontinued. For such cases the milk may be Pasteurized but not sterilized at high temperature.

DR. T. M. ROTCH, of Boston, had seen about twenty cases in recent years.

DR. F. FORCHHEIMER, of Cincinnati, wrote that in one of his cases the peculiar complexion lasted eighteen months after recovery. He thought that the disease was probably due to some chemical change in the blood, one which could be corrected by fruit juice and change of food. He had seen ten cases.

DR. A. JACOBI confirmed the view that sterilized milk was capable of causing the disease. He had seen scurvy in one baby of four months, in one of six months, and in a third of six weeks, and while two of them had not spongy gums, one, the baby of six months, but without teeth, did have spongy gums. He also advocated phosphorus, say ten to fifteen minims a day of the elixir phosphori, in addition to the dietetic treatment.

DR. L. EMMETT HOLT stated that in five of the six cases seen by him the disease had developed from the exclusive use of a well-known proprietary food. He thought these foods were employed more in the country than in the city.

DR. W. L. CARR had found scurvy rare in New York institutions. He had seen three cases in private practice. In one of the worst there was no gingivitis, but there had been diarrhœa. In this case there was also swelling of the forearms, but much less marked than that of the lower extremities.

DR. J. E. WINTERS said that one of the worst cases of scurvy he had ever seen was in a baby which had been fed exclusively on a proprietary food from birth; a very prompt and thorough recovery took place on no other treatment than the substitution of sterilized milk. In the several cases seen by him recently, the same treatment had been employed with like success, namely, giving sterilized milk. The one mistake in sterilizing milk consisted in sterilizing it too long; the process should never go beyond twenty minutes.

ACUTE INTUSSUSCEPTION IN CHILDREN.

ARTHUR E. J. BARKER, F.R.C.S. (*British Medical Journal*, February 17, 1894, p. 345) reports seven cases of acute intussusception in children, with details of treatment. His conclusions, founded upon the results of his experience and study, are as follows: 1. That in all cases of intussusception in children, injection of water or manipulation should be at once resorted to if the patient is seen within a few hours of the onset of the strangulation.

2. That if these means fail after a fair trial, not too much prolonged, laparotomy should be at once done as the safest treatment.

3. That there is a certain proportion of cases among all the varieties of intussusception which no amount of injection will relieve, or in which injection would be dangerous, and these can only be dealt with by opening the abdomen.

"ANOREXIA NERVOSA."

W. J. COLLINS (*Lancet*, January 27, 1894, p. 202) adds an interesting case to those already reported under this heading by the late Sir William Gull (*Lancet*, October 22, 1892, and *Transactions of Clinical Society*, 1874, vol. vii.). A girl, seven and a half years old, of healthy ancestry, had for ten weeks prior to her admission to the London Temperance Hospital persistently refused food and had only partaken of very small quantities after much coaxing. Latterly she had remained at home, lying doubled-up in bed, an object of compassion to her friends and neighbors. On admission to the hospital her skin was dirty, and she was infested with pediculi; the emaciation was extreme. The legs and thighs were rigidly flexed, and any manipulation evoked tenderness and tears. The joints, however, were unaffected, and reflexes normal. Her weight was thirty-three pounds. All the organs and excretions were normal, but some defined swelling and tenderness were noticeable over the outer part of the left thigh, which subsequently developed into an abscess. More remarkable, however, were the mental phenomena. She was reported to be very deceitful and intensely selfish; she took no notice of other children in the ward, was self-absorbed, very vain, and "told long stories of other people who had been ill just like her, and what terrible things happened to them." She asked for the Bible, as she cared for no other book, and she was effusively pious in conversation, though she used foul language to the nurses and was filthy in her habits.

Under careful feeding, cod-liver oil, and massage, her condition immediately began to improve, and with increasing weight and the restored use of her limbs her mental and moral state completely changed. After two months of treatment she weighed forty-four pounds, and the last report was that "she played with the other children, seemed interested in everything in the ward, and was easily manageable."

Lasègue refers to a similar condition under the term *anorexie hystérique*.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

JOHN SLADE ELY, M.D.,

PROFESSOR OF PATHOLOGY IN THE WOMAN'S MEDICAL COLLEGE OF THE NEW YORK
INFIRMARY; ASSISTANT IN PATHOLOGY IN THE COLLEGE OF PHYSICIANS
AND SURGEONS; PATHOLOGIST TO BELLEVUE HOSPITAL.

IMMUNITY: TYPHOID FEVER, DIPHTHERIA, TUBERCULOSIS, PYOGENIC MICROCOCCHI.

IN our somewhat disconnected review of the facts thus far developed in support of the "antitoxin theory" of immunity, we have discussed the evidence offered by the study of tetanus, diphtheria, pneumonia, hydrophobia, and glanders, and have found much support for the theory from a consider-

ation of experimentally induced immunity in animals, and from the analysis of cases of these diseases in man which have been treated, in accordance with this theory, with the blood serum of artificially immunized animals, or with the specific antitoxins which had been prepared therefrom. We have now to consider the additional evidence afforded by the study of typhoid fever, tuberculosis, and the pyogenic micrococci.

It will be remembered that in our notice of the experiments of the brothers Klemperer upon the artificial induction of immunity to pneumonia, mention was made of the fact that they had succeeded in producing immunity in rabbits by the introduction of the blood serum of patients convalescent from that disease, and that in our review of the therapeutic value of the blood-serum treatment of pneumonia it was stated that Neisser had treated pneumonia patients with apparent success with the serum of other patients convalescent from the same disease. Stimulated by these results, STERN has similarly experimented with the blood serum of six convalescents from *typhoid fever*, and of a seventh patient who had recovered from a well-marked case of the disease seventeen and a half years before, as shown by the hospital records. Five of the convalescents were under treatment in two hospitals in Breslau, and could consequently be thoroughly observed. The blood serum was obtained from the convalescents on the fourth, fifth, sixth, and eighth days after the subsidence of fever, and in one case it was again obtained five and a half weeks after the commencement of convalescence. The investigation was directed to the determination of (1) the germicidal power of this blood serum, and of (2) its power to induce immunity to the ordinary effects in animals of inoculation with virulent culture of the typhoid bacillus.

The results of twenty-two carefully conducted experiments with the blood serum of five convalescents showed it to possess even lower germicidal power than the blood serum, pleuritic exudate, and ascitic transudate of persons who had not had typhoid fever.

On the other hand, its protective or immunizing power was great; for virulent cultures, when treated with the blood serum of convalescents, became innocuous or of much lessened virulence when inoculated into mice, in five of six cases studied. This is explained on the theory that the noxious effects in animals of inoculations of typhoid bacilli are due to the toxins of that germ, not to the presence of the germ itself; and this theory is in turn borne out by the fact that the same effects resulted in Stern's experiments whether the germs were killed before inoculation of a beef-tea culture or not. In both cases the addition to the bouillon of the blood serum of convalescents from typhoid fever before inoculation deprived it of its noxious action.

These facts are believed by Stern to be explicable only on the theory of an antitoxic action of the blood serum of convalescents. But whether this antitoxic action depends upon direct chemical combination of its ingredients with the toxins of the disease, thereby depriving them of their poisonous qualities, or upon the stimulation by those ingredients to a greater power of resistance on the part of the tissues, he finds it impossible to decide.

Almost simultaneously with these experiments of Stern, it was discovered by PETRUSCHKY, in the course of some experiments relative to the nature of the pathogenic action of typhoid bacilli in animals, that the resistance of animals which had withstood an inoculation with the germs was much in-

creased as compared with that of other animals, which had not previously received the inoculation, and that a dose which at first produced pronounced symptoms failed to do so on a subsequent inoculation.

These results have in turn been indirectly confirmed by BITTER, who succeeded in establishing immunity in rabbits to large doses of the toxins of typhoid bacilli by repeated injections of small but constantly increasing doses of filtered glycerin-bouillon cultures of that germ. Animals thus treated withstood doses which killed other rabbits in from eight to twelve hours. The blood serum of animals thus immunized, when mixed with solutions of the typhoid toxins, deprived them of their toxic action, making them harmless in otherwise uniformly fatal doses.

By a similar though slightly different method, CHANTEMESSE and WIDAL have also succeeded in producing immunity in rabbits to typhoid fever. Their cultures before injection were attenuated by boiling. These sterile cultures, when injected in gradually increasing dose, conferred immunity both to the living germ and to its toxins. They further state that the serum of animals thus immunized possesses decided curative power when injected into animals within six hours after inoculation with a virulent culture, and that the serum of patients convalescent from typhoid both immunized and cured rabbits. This power was shown to be possessed by the blood of six convalescents from typhoid fever.

Continuing these studies, Chantemesse and Widal tested the curative power in man of the serum of immunized animals. Two patients received injections of the serum on the tenth and eleventh days of the disease respectively. In both cases the temperature fell, but again rose in a few hours, and the course of the disease was uninterrupted. But little was to be expected from these tests in the way of proof of the efficacy of the treatment, for in the first case the amount injected was admittedly too small—only 25 c.c. in all—and in both the treatment was instituted too late in the course of the disease to influence it materially.

Quite independently of Chantemesse and Widal, but following a suggestion of Stern, HAMMERSCHLAG treated five typhoid-fever patients with the serum of convalescents from that disease. In the first cases the serum alone was used, but in the later ones the whole blood was injected in doses of from 40 to 80 c.c. In the first three experiments no result was observed to follow the injections. In the fourth the temperature fell rapidly without collapse, but rose again in the course of about twenty hours. In the fifth case, also, there was a fall of temperature, but its cause was uncertain, as hemorrhage from the bowels occurred at the same time. It should, however, be noted that there was no accompanying collapse, and that a subsequent hemorrhage was not attended by fall of temperature. The course of the disease was apparently unaffected in both these cases.

On the whole, these therapeutic tests must be considered as quite inconclusive, though demonstrating the harmlessness of such treatment.

Results similar to those of Stern have been recently reported by KLEMENSIEWICZ and ESCHERICH as regards diphtheria. Blood was obtained by venesection from two patients on the fourteenth and ninth days, respectively, of convalescence from diphtheria. Its serum was shown to possess a marked protective quality when injected into guinea-pigs twenty-four hours before

inoculation with a virulent culture of the diphtheria bacillus. Animals thus treated remained healthy after inoculation with cultures which killed guinea-pigs not thus treated in from thirty to thirty-six hours. This protective action was found to have disappeared in the course of two weeks, the animals after that interval succumbing to the inoculation. Control experiments with the serum of persons who had not had diphtheria showed it to possess no similar protective quality.

Early in 1892, TIZZONI and CENTANNI published the results of experiments directed to determining the power of Koch's tuberculin to protect animals against inoculation with *tuberculosis*, as the result of which they are led to believe that a measure of immunity to that disease may be thus induced.

Animals which had received injections of tuberculin for some time prior to inoculation were found to be much more resistant than animals not so treated; they often remained in good general condition notwithstanding the development of a pronounced local lesion at the point of inoculation, and after killing the animals there was usually found to be no widespread distribution of the tubercular lesions, as was always the case in the control animals similarly inoculated. As the experiments were made with guinea-pigs, the most susceptible of animals to tuberculosis, it would not be unreasonable to expect even more striking results with other less susceptible species. Tizzoni and Centanni attribute this protective action to the formation of antitoxins in the blood as the result of the tuberculin injections.

HÉRICOURT and RICHEL have also succeeded in immunizing animals to tuberculosis, but in a somewhat different way.

It has been demonstrated by a number of observers, including Koch himself, that the spontaneous tuberculosis of fowls is caused by a bacillus closely resembling the bacillus tuberculosis of man, but differing from it in a few important details, more particularly as regards its virulence in animals. It is therefore regarded as a variety of the tubercle bacillus. Héricourt and Richet succeeded in immunizing dogs to the bacillus tuberculosis of man by inoculations with bird-tuberculosis. The ten animals so treated withstood the more virulent variety, gaining in weight and giving every indication of perfect health, whilst six control dogs, not so treated, succumbed to the disease.

But little has as yet been accomplished in the study of immunity to the ordinary pyogenic micrococci, the *staphylococcus pyogenes aureus* and the *streptococcus pyogenes*.

In 1891, RODET and COURMONT succeeded in separating two substances, quite distinct from one another, from pure cultures of *staphylococcus* by precipitation with alcohol. One, soluble in alcohol, was found by experiment to intensify the effect of inoculations of the staphylococcus; the other, insoluble, was found to have a protective action. The noxious substance was found to be more abundant in the cultures, which is believed to account for the non-action of the protective substance when both are simultaneously introduced with a culture. The noxious substance is, however, more susceptible to heat, for by heating cultures for twenty-four hours at 55° C. it lost its activity, and such cultures were found to be protective.

The generalization of the authors, that similar antagonistic substances are produced in pure cultures of all bacteria and that the deleterious substance

is always the more vulnerable, seems hardly warranted. They are hopeful that protective effects may be obtained in many diseases by the injection of cultures attenuated by heat.

Results similar to those of Rodet and Courmont have been obtained by ROGER.

Pursuing this subject still further, MIRONOFF, after confirming the results of Roger, has succeeded in transferring immunity from one animal to another by injections of its blood serum. The immunity obtained by attenuated cultures and by this method were found to be identical. Neither are complete, but the animals were shown to be able to withstand inoculations of from five to ten times greater amount than before, and local changes occur at the point of inoculation even then. The serum of immunized animals possessed no germicidal quality, but was shown to have a decided curative effect upon animals suffering from streptococcus septicæmia, the degree of the benefit being directly proportional to the degree of immunity of the animal from which the serum was obtained and to the amount of it injected.

We see, then, that the study of typhoid fever, tuberculosis, and the pyogenic micrococci has added to the evidence already adduced in support of the antitoxin theory of immunity. The facts, when not directly contributing to that theory, are still in accord with it. Something inimical to the pathogenic action of their respective germs has been shown to exist in the blood of convalescents from typhoid fever and diphtheria, self-limited diseases, and in pure cultures of the pyogenic cocci, and antitoxins are believed to have been produced in the body by injections of the toxins of tuberculosis. And, furthermore, in all these diseases, except tuberculosis, the blood of immunized animals has been proved to possess immunizing power, though not endowed with any germicidal action. The failure of Chantemesse and Widal and of Hammerschlag to cure typhoid-fever patients with injections of the blood of convalescents should not be accorded too much weight as militating against the antitoxin theory. Only a few injections were given in each case, and the doses were small, whereas it has been demonstrated by animal experiments that much larger doses are necessary to cure than to produce immunity. Furthermore, the experiments of Chantemesse and Widal on animals showed the necessity of early exhibition of the curative injections, and this cannot be said to have been done in any of the cases treated.

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All communications should be addressed to

DR. EDWARD P. DAVIS, 250 South 21st Street, Philadelphia, U. S. A.

Or

DR. HECTOR MACKENZIE, 59 Welbeck St., Cavendish Sq., W., London, Eng.

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NEPHRITIS IN ITS SURGICAL ASPECTS.¹

BY EDWARD L. KEYES, M.D.,
OF NEW YORK.

PART I.—INTRODUCTORY.

So many inflammations of the kidney have a surgical side that I must define the limits of my subject. I shall speak only of suppurative pyelonephritis, that common malady sometimes called "the surgical kidney," and I shall consider it both as it occurs spontaneously and as a complication of vesical disorder, the drift of my discussion to be a consideration of etiology and of the practical means of preventing the malady.

The subject, though well worn, is not threadbare. Investigators are still struggling with its problems, although much light has been already thrown into its dark corners—light which is reflected in the routine methods of the practical surgeon of to-day, enabling him to conduct his patient more safely past points of danger than was in any way possible a few years ago.

Much of this light emanates from laboratorial researches carried on abroad—notably in France, under the inspiration of Guyon—and from these researches I must borrow largely in introducing my subject.

It has been contended that the name "surgical kidney" is a misnomer (C. Lucas), since its existence is often due to the lack of intelligent surgery, and that it would be as logical to name a riot a "policeman's mob," because it was due to the absence of that enforcer of the law; but

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the distinction is captious. The term may well remain, since the surgical kidney is a complication for the most part of surgical disorder, and its study within the domain of surgical pathology.

Modern demonstration shows in a manner which the logical mind must accept that suppuration in the kidney, as elsewhere, is associated with the existence of micro-organisms, and due directly to their presence. Yet a distinction is here necessary, as it is, for instance, in the contemplation of contagious disorders, for the production of which, as Bouchard aptly puts it, something more is necessary than the accidental encounter of a man and a microbe; the soil must be suitable, the conditions must be favorable, or the seed does not take root.

I cannot discuss the controversial aspect of microbic infection, as this paper aims at being practical, but must ask you to accept, what wide demonstration at many hands has proved, that without the co-operation of microbic infection there is no suppuration in the urinary passages.

Since Pasteur opened the subject in 1859—less than a lifetime ago—by noticing that boiled urine remained sweet, while dust brought decomposition to it, and, with Van Tieghem, fastened the blame upon what he called “*torules ammoniacales*,” all through the line of Traube, Cohn, Fels and Ritter, Hiller, Niemeyer, Klebs, Lister, Lancereaux, Lepine, Roux, Albarran, Hallé, Krögius, Schnitzler, Rovsing, Clado, Chabrié, Escherich, Morell, Achard, Renant, Reblaud, Guyon, and a host of others, the demonstration has been progressive, and no escape has been possible from the flat conclusion: In the urinary tract, no microbes no suppuration. The protest of Enriquez is by the way, together with that of Manotti and Bachiocchi and others—for that even normal urine may contain germs, and that the kidney may eliminate such, without the necessity of accompanying renal inflammation, may be granted; we have only to revert to Bouchard’s aphorism of the man and the microbe: The seed may be old, it may be unsuitable; the soil may not be ready; surely every man in an epidemic does not acquire disease.

The healthy urethra is well known to be the habitual residence of numerous micro-organisms, some of them pathogenic, just as the external integument is; yet they cause no disease under normal conditions. So much at home are they, indeed, and so intimately bedded among the cells and in the ducts of the mucous glands, that no amount of prolonged irrigation with hot water, boric acid, or even 1 in 1000 nitrate of silver solution at the hands of Petit and Wassermann could succeed in rendering this membrane sterile; inoculation of its mucus (after irrigation) in bouillon tubes always gave positive results.

This, at least not aseptic, condition of the urethral mucous membrane stops in health at the cut-off muscle. Beyond and above all is pure, and Guyon with his pupils, as well as others, have amply demonstrated that urine taken aseptically from the bladder is sterile.

How and why, then, in cases of suppuration does it become contaminated?

The *How* is clearly by way of the introduction of micro-organisms, either by (1) propagation along the mucous surface by reason of local damage to the deep urethral membrane [tubercle, cancer, stone, bruising violence, erotic excitement, gonorrhoea, gouty congestion, enlarged prostate—or spontaneously]; (2) introduction by the surgeon upon his instruments; (3) bursting into the urinary tract of some extraneous focus of suppuration; (4) transmission through the unbroken tissues from a neighboring focus—it has been even alleged that the bacterium coli commune may get through from the rectum and do its work upon the mucous membrane of a bladder ready to receive it (5) by descent from the blood downward through the kidney—but this, except the wedge-shaped pyæmic foci, is very uncommon, and, as in Bouchard's suppurative nephritis occurring during the course of a general infectious malady, the suppuration commencing in the kidney, usually remains there and does not descend into the bladder.¹

I cannot halt here to discuss these various alleged methods of invasion, but pass on to the more important *Why?*

Why do micro-organisms produce suppuration in some instances and not in others? This opens the question of preparation of the soil.

As early as 1873 Fels and Ritter, by inoculating the bladders of dogs, produced ammoniacal urine and cystitis—but only on condition of ligating the urethra. Upon loosening this ligature the bladder promptly resumed its condition of health. So Guyon, Albarran, Guiard, and many others, introducing pure cultures of micro-organisms into the healthy bladders of animals, fail to set up cystitis unless to the microbic germ there be added other factors, such as ligating the urethra to produce forced retention, or wounding the bladder. Certain micro-organisms have proved themselves more virulent than others, just as certain subjects are exceptionably susceptible, and Schnitzler claims that with the “urobacillus liquefaciens septicus” he can produce cystitis without tying the urethra. This urobacillus is now believed to be identical with the bacterium coli commune; more evidence is therefore needed. Barlow has recently contributed some testimony on this point.

But Guyon, Petersen, Albarran, and many others have repeatedly proved that retention, ligating the urethra, trauma—not one of these causes alone will produce cystitis, and that anyone of them plus the proper germ will do it. Straus and Germont clearly proved that simple ligature of the ureter, aseptically performed, does not occasion inflammation of the kidney, but produces dilatation, and then atrophy; while Charcot and Gombault, with equal clearness, have demonstrated that septic ligation of the ureter does produce the suppurating kidney.

¹ Albarran has produced descending pyelitis experimentally.

That trauma prepares a soil for microbic infection is beautifully illustrated by Albarran. He showed that the blood might be a channel of infection by inoculating one ureter and ligating it below; then finding both kidneys implicated, as being spots "*minoris resistentiæ*"—the ligated side because of congestion and of direct infection, the other on account of its hyperactivity from having had double work to do. Then Albarran injected his bacterium pyogenes directly into a bloodvessel in a number of animals, and got plenty of embolic abscesses in every instance, but found the kidneys free in all save one. To study the effect of injury plus germs, he therefore contused one kidney in a rabbit and injected a pure bouillon culture of bacterium pyogenes into its ear. The next day this kidney was already in commencing suppuration. He produced nephritis also by injecting the ureter (and ligating) with streptococcus pyogenes, and with staphylococcus aureus as well.

Indeed, how many kinds of germs there may be capable of setting up suppurative nephritis, I do not know. That there are a number seems certain; but there still exists confusion among authorities, and the last word has not been spoken. Nor is the method of action quite agreed upon, Rovsing believing that ammoniacal fermentation of urine is a factor of prime importance, while Guyon upholds that this feature is secondary. That it is not always essential is shown by the fact that there is such a thing as acid cystitis. Uncomplicated tubercular cystitis is an example in point.

As for the single germ named by investigators seeming to have the most pernicious qualities, it appears to be growing more and more clear that this germ is the bacterium coli commune,¹ a bacillus similar to, if not identical with that commonly found in the colon under all circumstances.

This it seems is the same as the urobacillus septicus, and as the septic bacterium discovered by Bouchard in 1879, by Clado and by Hallé in 1887, studied intimately in 1888 by Albarran and Hallé, and by Albarran in 1889 as the bacterium pyogenes, by Rovsing in 1889 as the coccobacillus ureæ pyogenes, by Chabrié in 1892 as the uro-bacillus non-liquefaciens septicus, by Morell as the bacterium lactis ærogenes, by Krögius, Achard and Renant, Reblaud, etc.; all these seem to be the same time-honored bacterium coli commune. This germ is most often found in bad cases. Associated with it, or alone, may be found also the staphylococcus pyogenes aureus and the streptococcus pyogenes.

Accepting then, from experimental data, that suppurative inflammation along the urinary tract demands for its production, first, a micro-organism; second, a soil properly prepared by overdistention, congestion, or trauma, let us next turn to the clinical side of the picture, and see whether the same conditions obtain.

¹ 4 to 6 μ long, 2 μ broad, with rounded ends; staining by Weigert's method.

Surely they do. The young and vigorous bladder and kidney do not suppurate except for trauma—injury, stone, tumor, stricture, gonococcus, tubercle; in weakly young subjects they do suppurate when depressed nerve force and atony of the circulation, or intense congestion from repeated erotic cause, may be presumed to prepare the way through the congestive process. We all know with what liberty young subjects may be handled instrumentally. The slight disturbance following sounding or catheterism quickly subsides; urethral fever and surgical kidney are here almost unknown.

Again, in youth and vigorous manhood, when the bladder is strong and capable of emptying itself, when there is no atony—in cases of retention from fever, coma, spasmodic stricture, with what carelessness the catheter may be used, and no evil result follow; and even in such cases, although there be added traumatism and congestion produced by stone, stricture, gonorrhœa, or even tubercle; here, too, in the young and vigorous, even moderate care and cleanliness yield results in the main satisfactory; high grades of inflammation are not produced by careful instrumentation, and ascending pyelitis is wholly exceptional. But in these cases a muscularly healthy bladder is presumed to exist, one capable of demonstrating, by frequently and entirely emptying itself, the value of Guyon's maxim, "The bladder is the guardian of the ureters."

But how does the picture change when in waning life, be it premature or in the fulness of time, the nerve force fails, the bladder loses its expulsive tone, its muscular wall becomes replaced by tissue more or less fibrotic, crowding out and atrophying the muscular fibre, when there is more or less residual urine, when the ureters are dilated. Now let there be occasion for the use of any instrument in the bladder, and it requires often the utmost skill and attention, with all the asepsis and antisepsis which we can command, to avert septic conditions which readily climb the ureter through the door thrown open by previous preparation of the soil, and, producing the true surgical kidney, terminate the life of the patient, positively by reason of the surgeon's interference. Here the soil is rich and ready for the seed—the surgeon plants the seed in the urine, until then clear, and the patient reaps the harvest.

The physical soil is prepared by anything that weakens the bladder, congests or bruises its surface. Thus all antecedent conditions of disease for which the aid of the surgeon is invoked—stricture, prostatic enlargement, stone, tumor, retention—prepare the soil more or less, and it behooves the surgeon to be watchful about sowing the seed.

Turning again to the experimental field, let us study briefly the effect of the most active of the causes which prepares the way for kidney invasion from below. This cause is retention of urine or bladder tension, anything that interferes with the free and perfect passage of the urine downward from the kidney.

James has determined by experimentation the normal urinary pressure within the ureter to be about two and one-half centimeters of mercury, and Hermann has shown that a pressure of six centimetres almost suppresses the urea in the urine. Guyon, Albarran and others, have proved by experiment upon animals, that sudden closure of the ureter does not lead to a distention of this canal. The kidney does become distended, then some of its contents are reabsorbed, next the kidney undergoes atrophy. This circumstance caused Guyon to suggest that when the ureter was accidentally severed in some abdominal operation, the duct should be ligated aseptically and the kidney left to atrophy, thus saving the patient a needless nephrectomy. The kidney will not suppurate. Crooke found this atrophy of the kidney to have taken place in a female where the ureter had been aseptically occluded by a cyst of the broad ligament. The ureter was not dilated.

All this question of the effect upon the kidney of rapid closure of the ureter and of the slower process of obstruction below has been experimentally elucidated by Guyon upon dogs.¹ Absolute aseptic ligature of the ureter leaves the duct unaltered, causes dilatation, then atrophy of the kidney, the papillæ becoming flattened, the tubes dilating, the kidney substance getting sclerotic, and then withering. Tension in the kidney at first increases quickly, as shown by the mercurial manometre, to 40 millimetres in twenty minutes, and to 73 in an hour, dropping again swiftly to 44 millimetres in four and a half hours. After twenty-six days it becomes 11 millimetres, and after sixty-two days 3 millimetres, which is about what James has shown to be the normal pressure.

When, however, the obstruction is less acute, as when the urethra is ligated, polyuria is a first result, with a progressive diminution in the quantity of urea contained in the urine, shown by the fact that the urine in the bladder always contains more urea than that taken from the ureters, the latter more than can be obtained from urine found in the pelvis of the kidney, circumstances which go to prove three things: first, that the dilatation of the ureter takes place from above downward; second, that the diminution in the secretion of urea is progressive, and third, that regurgitation of urine does not take place; what was first excreted goes to the bladder, the last remains in the kidney. In vesical hæmaturia from acute retention of urine the fluid in the ureters remains pale, that in the bladder being bloody.

The slowly progressive dilatation of the ureter from above downward, and not from below upward, is admirably brought out in the thesis of Hallé.

In some cases of stricture, when the vesical muscle continues powerful, it is probable that the ureters are forced, because their orifices are

¹ Experiments conducted by Albarran and Chabré.

found widely dilated, but in most instances, and notably in the case of thin-walled, weak bladders, or in thick-walled, sclerosed, weakened bladders, where there is atony, the ureter, although widely dilated, has a very small vesical orifice. Moderate obstruction below to free urinary outflow, even painful vesical spasm, is believed to be capable of leading to dilatation of the ureters, and of causing the renal changes incident thereto, changes which make the kidney resemble a senile organ, and prepare it fully for microbic invasion.

A difference, however, is here. In the senile organ, partly atrophied and partly sclerosed as it is, there is an abasement of function. A number of observers agree upon this point. I may cite notably the thesis of Pierre Roche, who concludes that in the aged the quantity of urine is reduced one-sixth, the phosphoric acid is diminished by two-thirds, urea by one-half, chlorides unaltered, density about normal.¹

Such abased function is not found in the kidney damaged by gradual chronic overdistention. Here there is an irritative element. Polyuria, very active polyuria, worse at night, is the rule. Ultzmann makes polyuria a constant sign of chronic pyelitis; and Oppolzer has even gone so far as to say that many cases of diabetes insipidus are only instances of chronic pyelitis unrecognized.

I personally look upon this sign, polyuria, in an old man, with ever-increasing respect. An individual with this symptom markedly present I consider the worst of all possible risks in case of operation. I greatly prefer to operate upon the bladder of a man having intense suppurative pyelitis on both sides, whose urine is full of casts and loaded with albumin, and I expect him to get well after a serious operation with much more hope than I do a patient having clean, light, thin urine, containing no albumin, or only a trace, and either no casts or only an occasional hyaline one, but who presents this symptom, polyuria, to a marked extent.

Cases therefore suffering from the results of slow prolonged obstruction below, and with dilated ureters, be their condition due to stricture, prostatic disease, stone, or old age, are subjects ripe for suppurative infection of the kidney, brought on either spontaneously by a mounting upward of the microbic infective agent from below in the natural course of progressive suppurative disease unrelieved by treatment, or by an implantation of the seed through the instrumentality of the surgeon.

For although the dilatation of the ureter takes place from above downward, yet after it has occurred, micro-organisms introduced into

¹ Roche, following Bouchard, puts the daily average secretion of urine in old age at 1350 grammes, Rayer at 1824 c.c., Becquerel at 1267, Vogel between 1400 and 1600, Gubler between 1200 and 1500, Hepp at 1500. Beigel at 1320, Ballet from nineteen observations (150 tests) at between 500 and 800 grammes, his patients being from 70 to 86 years old. Therefore, polyuria is not a natural condition in old age. Its existence means disease. Albumin is not a normal ingredient of the urine of old age.

the bladder, and even particles of inert solid matter so introduced, shortly find their way upward, and may be recovered in the pelvis of the kidney, as has been demonstrated at the hands of several investigators. Inorganic matter, such as coal-dust, mounts slowly; organic matter (micro-organisms) rapidly.

The deductions to be drawn from this brief summary of facts are roughly:

1. To use reasonable care in exploring a healthy bladder or passing any instrument into it.
2. To use greater care if there be traumatism from stone, tumor, stricture, especially if the powers of the individual be weakened by age or disease.
3. To exercise every known precaution in exploring and manipulating, instrumentally, cases of dilated bladder in a fibrotic state, with enlarged ureters and damaged kidneys.

PART II.—PRACTICAL APPLICATION OF THIS RÉSUMÉ.

I now reach the practical question: *How* shall the kidney be guarded?—for prophylaxis is more than cure—a kidney once in positive *chronic* suppuration does not get well. Acute suppurative cases very often die; less active ones suppurate indefinitely, and, eventually kill, by the process of urinary cachexia, so-called, in most instances.

The ends to be kept in view are (1) to avoid all unnecessary traumatic violence, and (2) to maintain asepsis, particularly, when the urine is clear, and more especially so when there is a weak bladder, residual urine, and dilated ureters.

When the bladder and kidney are already in chronic suppuration the indication is to attempt to destroy micro-organisms by direct antiseptic applications below, and to sterilize the urine by medicines from above. This means an attempt at asepsis in instrumentation, antiseptics in topical and in internal medical treatment.

Although these ends may be aimed at, none of them can be absolutely reached clinically;¹ for let instrumental asepsis be carried even to perfection, yet the pendulous urethra harbors a multitude of germs, some of them pathogenic; and this anterior urethra cannot by any known process be absolutely clarified; therefore, be the instrument ever so clean, it may push some noxious germ before it into the bladder, where finding proper pabulum, it may multiply to the patient's discomfort; in

¹ Nor are all persons equally susceptible, moderate interference producing chill in one, when another, apparently in a more receptive condition, escapes entirely. Thomson, a medical missionary, states that among the Chinese urethral fever is unknown. Stricture and vesical calculus, he thinks, are more common in the province of Kwang-Tung than anywhere in the world, and in the hospital sounding and catheterism are practised daily, yet, he says, "In not one single case have I observed the fever that is so frequently concomitant to similar operations in Great Britain." He ascribes this to Chinese phlegmatic temperament, and apparently uses no preventive precautions.

this way the victim being, as it were, "hoist by his own petard." Fortunately, the surgeon can kill this germ, and often Nature can dispose of anything short of massive infection.

On the other hand, it is absolutely impossible to disinfect a bladder in chronic suppuration by any antiseptic irrigation, since many of the micro-organisms lie concealed, imbedded in the cells, protected from the action of the antiseptic lotion. Finally, medicines acting through the stomach do not effectively destroy micro-organism in the kidney—although they help in the main issue.

But shall we on account of these rebuffs fold our hands placidly and let Nature struggle unaided? By no means. Indeed, we can do very much, in a helping way, as daily experience attests. With modern methods it is nearly possible to do away with urethral and urinary fever. An old prostatic with thin bladder, clear urine, atony, dilated ureter, and damaged kidney, may be so handled as to escape catheter fever entirely, and to emerge into catheter life with sparkling urine and no pyelitis.

How shall this end be attained? The complicated methods of asepsis which have been advocated cannot endure; they must be made simple to become generally adopted. Machines for forcing sulphurous acid fumes or steam through catheters are well enough for specialists and special occasions, but they cannot be broadly applied. Boiling water (or dry heat for solid instruments), bichloride of mercury or nitrate of silver, 1 in 1000, are all that is required. Woven instruments should be discarded as far as possible on account of the difficulty of keeping them clean. All instruments after use should be subjected to boiling water, hollow instruments injected with alcohol before use and soaked for an hour in bichloride or twenty minutes in nitrate of silver solution.

But it is not essential, except on special occasions, to use all these precautions. For an operation or a first exploration in an aseptic case they are essential. It is all-important always to avoid traumatic violence as far as possible. This factor, according to my experience, is more important than very high class asepsis. Moreover, in the young and healthy, simple cleanliness may suffice; in the old and feeble asepsis and antisepsis are essential. Then, again, in the great majority of those in whose behalf instrumentation is called for, chronic suppuration already exists, and it is hardly logical to strain at attempts to avoid befouling a pool which is already defiled. Therefore, simple but perfect cleanliness (hot water) and the avoidance of traumatism are enough in most instances, except when an operation is to be performed, an exploration to be made, or catheter-life started upon a patient whose residual urine is clear. Here rigid asepsis and antisepsis are desirable. I have no respect for that minute detail sometimes advocated which counsels a bichloride towel and disinfection of the meatus for every simple passage of the

sound, and strives to render an old man's catheter life still more intolerable by forcing him to sterilize a number of catheters, to keep them in glass tubes stopped with cotton, and to disinfect his meatus at every instrumentation. Few old men will or can continue to do this, nor is it necessary.

I see no advantage in sterilizing or borating vaseline or glycerin. I had cultivated some vaseline taken from a pot in use for twenty years. This pot had never been disinfected or sterilized or its contents medicated in any way. It had been wiped out when empty, refilled from a supply can, and kept generally covered. I had some glycerin similarly cultivated. It was taken from a bottle never sterilized or medicated in any way, and in use for many years for catheter, cystoscope, and endoscope. These specimens yielded on cultivation only some ordinary air species of germs—nothing pathogenic.

The method of instituting catheter life which yields me all the satisfaction I require is the following: A rubber catheter is kept constantly in a 1 in 4000 bichloride solution and washed in very hot water after each use. Simple glycerin is the lubricant. The anterior urethra is to be flushed as the catheter enters for the first time, and all the way in through the membranous and prostatic urethra, with a 1 in 4000 bichloride solution. The urine is to be entirely but *very slowly* drawn off (watching the pulse), the patient being recumbent. The bladder is then to be immediately washed out with a 1 in 1500 (sometimes 1 in 2000, if the stronger causes too much pain) nitrate of silver solution, which usually occasions moderate temporary tenesmus. The bladder may then be washed out with a 6 per cent. salt solution (heaping tablespoonful to the quart), this to be drawn off, and such quantity of a weaker salt solution (teaspoonful to the quart) introduced and left in as the surgeon may think best.

The clean catheter, taken out of its bichloride solution and rinsed in hot water, and the salt solution, are to be used as often as any catheter is called for—further urethral flushing being a matter of personal judgment—the nitrate of silver repeated every one, two, or three days.

With such simple precautions catheter life may be safely instituted without implicating the kidneys, and often (unless the bar at the vesical neck bleed from being bruised) with (practically) an absence of pus in the urine, and this goes on until the tissues become hardened, when a non-disinfected catheter may be safely used, if simply kept clean.

When an operation is to be performed the urine is usually already purulent. In this instance it is better, and it has become almost a routine matter with me, to flush out the entire urethra and bladder before the operation with a salicylic acid solution followed by a 1 in 3000 or 4000 bichloride solution (this after the anæsthetic has been administered), and to follow the operation by a flushing out with a

nitrate of silver solution, 1 in 1000; finally, and in subsequent washings for cleanliness, using about a 6 per cent. solution of common salt in hot water, and such strengths of mercuric or argentic irrigation as seem called for.

I have discarded Thiersch's solution and boric acid for the same reason, difficulty of prompt preparation. If the Thiersch solution be made on the spot (salicylic acid, ʒss; boric acid, ʒiiss, in powder, added to a quart of hot water, is near enough to the formula) it dissolves slowly. If the cold solution has to be heated it is troublesome. Boric acid also dissolves slowly, and the bacteriological experiments soon to be detailed show that it is no more effective in killing germs than is salt and water. Now salt dissolves at once, and it is more cleansing than simple water, therefore I use it; and salicylic acid besides being an admirable germ-killer, as the bacteriological tables will show, has the extra advantage, first pointed out by Bryson, of St. Louis, of penetrating further and cutting deeper into the thick cohesive muco-pus of chronic catarrhal inflammation than any other substance. Therefore I have had made a solution of salicylic acid in alcohol, eight grains to the ounce. The bacteriological tables show that one-half grain salicylic acid to the ounce is as effective a germ-killer as Thiersch's solution, consequently, by adding one ounce of my alcoholic salicylic acid solution to a pint of hot water, I have a mixture promptly made and as effective as that of Thiersch.

These are the solutions, and this the routine method upon which I rely for avoiding kidney complications when surgical interference upon the bladder is called for.

Medicines to affect the urine and the flushing of the kidney by diluent waters—adjuvants of no mean value in keeping down kidney complications and moderating them when they exist in a chronic form—I shall speak of after I have detailed the result of the bacteriological work, which forms an essential part of this study.

PART III.—THE BACTERIOLOGICAL STUDY.

In order to investigate the bacteriological side of this question of kidney and bladder infection, with consequent suppuration, and to see what confirmation or dissent would be furnished to the conclusions which clinical observation justified, I determined to institute a rather extensive series of experiments, and obtained the co-operation of Dr. E. K. Dunham, Professor of Histology, Bacteriology, and Hygiene in Bellevue Hospital Medical College, a gentleman whose position insured his disinterestedness and capacity. I selected nearly all the substances I was accustomed to use either for local application or through the stomach, and asked him to determine their relative destructive power, if any, upon pure cultures of *staphylococcus pyogenes aureus*, of *streptococcus pyo-*

genes, and of bacterium coli commune. I incorporate his tables and his remarks as to the process employed.

The substances chosen to be experimented with¹ are the following:

1. 1 in 1000 mercuric bichloride.
2. 1 in 2000 " "
3. 1 in 3000 " "
4. 1 in 4000 " "
5. 1 in 5000 " "
6. 1 in 10,000 " "
7. 1 in 500 argentic nitrate.
8. 1 in 1000 " "
9. 1 in 2000 " "
10. 4 per cent. solution of boric acid.
11. 10 per cent. solution of common salt.
12. 20 " " " "
13. 30 " " " "
14. Thiersch's solution.
15. Acid salicylic, gr. ss; alcohol, 3ss; water, 3j.
16. Marchand's peroxide of hydrogen, 1; water, 3.

All these were to be tested for various lengths of time. Vaseline also was furnished from a pot not prepared, not disinfected in any way, and in common use for many years, and common glycerin from a bottle which had been in use for many years.

I supplied also many medicated urines. I selected two individuals in apparent good health whose conduct I could control. They took the same medicine at the same time, and at intervals of about four days specimens marked A, B, A1, B1, etc., were sent to the laboratory for investigation, Dr. Dunham being at the time ignorant of the kind of medicine that was being experimented with.

I was guided as to my interval of time between the tests by observing that the greenish-blue color imparted by methylene-blue to the urine, being most dense about eight hours after the drug was swallowed, practically disappeared during the fourth day, although faintly visible upon the fifth—an overlapping that could not be important. About five thousand examinations in all were made.

REPORT ON A SERIES OF EXPERIMENTS TO DETERMINE THE VALUE OF CERTAIN SOLUTIONS AS GERMICIDES, MADE FOR DR. E. L. KEYES IN OCTOBER AND NOVEMBER, 1893, BY EDWARD K. DUNHAM.

The solutions experimented with were, first, solutions of chemical substances made of definite strength, distilled water being used as a solvent; second, samples of urine from healthy individuals after the exhibition of certain drugs.

¹ I did not test potassium permanganate or carbolic acid, as I very rarely use them.

The bacteria used to test the germicidal value of these solutions were: *Staphylococcus pyogenes aureus*, *streptococcus pyogenes*, and *bacterium coli commune*. The cultures used were either vigorous cultures in bouillon grown in the incubator at a temperature of about 36° C. about twenty hours, or a similar culture upon agar-agar, cultivated at the same temperature for the same length of time.

The experiments made can be divided into two groups, which were designed in one group to favor the action of the substances in solution by bringing them into the most intimate contact with the bacteria experimented on; while in the other group of experiments an attempt was made to favor the bacteria by necessitating the penetration of the solution through a thin layer of bacterial growth before contact with all the bacteria could be effected. The details of the procedure were as follows:

GROUP I. Five cubic centimetres of the solution, or urine, were introduced into a sterile test-tube by means of a sterilized pipette. One drop of the twenty-hour bouillon culture of the bacterium was then introduced and the mixture well shaken. One loop (*circa* one drop) of the mixture was then removed after a definite interval of time, and either introduced into a tube of melted gelatin which, after mixing its contents, was placed in a horizontal position until the gelatin had solidified, or the loop of the mixture of solution and bouillon culture was distributed over the surface of agar-agar solidified obliquely in a test-tube. The growth which took place in the gelatin or agar tubes was then observed and recorded.

GROUP II. A series of test-tubes in which agar had been solidified obliquely were inoculated with the bacteria to be experimented upon, and placed in the incubator for about twenty hours. Into these tubes enough of the solution or urine to be tested to completely cover the growth of bacteria was poured. After a given length of time the solution or urine was poured off, the layer of growth washed with about ten cubic centimetres of sterile bouillon, and then either a gelatin tube or an agar tube inoculated with some of the growth remaining in the tube. On successive days the original agar tubes, the bouillon with which they were washed out, and the gelatin or agar tubes inoculated from them, after the washing with bouillon were all examined for evidence of growth and amount of growth, and the results recorded.

The urine received for use in these experiments was not free from living bacteria. It, therefore, was necessary to make sure in each case that the growth of the various culture tests were of the species intentionally experimented upon. In the case of the *staphylococcus pyogenes aureus* a simple inspection of the growth upon agar was deemed sufficient to decide this point. In the case of the *streptococcus* the growth was examined in hanging drops, and if the coccus chains containing the individual cocci of the proper dimensions were observed a positive result was recorded. As a matter of fact, the growth when present was in nearly all cases sufficiently typical to leave no room for doubt as to the identity of the species. To test for the presence of living *bacterium coli commune*, gelatin cultures were chosen, and if white non-liquefying colonies of proper size, accompanied by gas production developed, the result was recorded as positive.

Some of the mixtures were allowed to stand for the specified time at the temperature of the room, which varied from 65° F. (16° C.) to 72° F. (22° C.)

EXPERIMENTS WITH CHEMICAL SOLUTIONS AND MEDICATED URINES.

o no growth.
x slight growth.
xx moderate growth.

xxx considerable growth.
xxxx vigorous growth.
† Test defective.

Solution used.	Bacterium.	GROUP I. Time of exposure, and result.				GROUP II. Time of exposure, and result.			
		2 min.	10 min.	1 hr.	24 hrs.	2 min.	10 min.	1 hr.	24 hrs.
Mercuric chloride, 1 in 1000	{ Sta. p. a.	o	o	o	o	x	x	o	o
	{ Strep.	o	o	o	o	o	o	o	o
	{ Coli.	o	o	o	o	o	o	o	o
1 in 2000	{ Sta. p. a.	x	x	o	o	x	x	x	o
	{ Strep.	x	o	o	o	o	o	o	o
	{ Coli.	o	o	o	o	xxxx	xxxx	x	†
1 in 3000	{ Sta. p. a.	xx	x	†	o	x	x	x	o
	{ Strep.	o	o	o	o	o	o	o	o
	{ Coli.	x	x	o	o	†	xxxx	xxxx	†
1 in 4000	{ Sta. p. a.	o	o	o	o	xxxx	xxxx	xxxx	†
	{ Strep.	o	o	o	o	†	†	†	o
	{ Coli.	o	o	o	o	†	†	†	†
1 in 5000	{ Sta. p. a.	x	x	x	o	xxxx	xxxx	xxxx	†
	{ Strep.	†	†	o	o	o	o	o	o
	{ Coli.	x	x	x	o	xxxx	xxxx	xxx	†
1 in 10000	{ Sta. p. a.	xxxx	xxx	xx	o	xxxx	xxxx	xxxx	xxx
	{ Strep.	o	o	o	o	xxxx	xx	xx	x
	{ Coli.	o	o	o	o	xxxx	xxxx	xxx	xx
Argentinc nitrate, 1 in 500	{ Sta. p. a.	o	o	o	o	xxxx	xxxx	xxxx	†
	{ Strep.	o	o	o	o	†	†	†	o
	{ Coli.	o	o	o	o	xxxx	xxxx	xxxx	†
1 in 1000	{ Sta. p. a.	o	o	o	o	xxxx	xxxx	xxxx	†
	{ Strep.	o	†	o	o	xxxx	xxxx	xxxx	†
	{ Coli.	o	o	o	o	xxxx	xxxx	xxxx	†
1 in 2000	{ Sta. p. a.	o	o	o	o	xxxx	xxxx	xxxx	xxx
	{ Strep.	o	o	o	o	xxx	xxx	xxx	o
	{ Coli.	o	o	o	o	xxxx	xxx	xxx	xx
Mercuric chloride, 1 in 4000 at 95° F.	{ Sta. p. a.	x	x						
	{ Strep.	o	o						
	{ Coli.	x	o						
Argentinc nitrate, 1 in 1000 at 95° F.	{ Sta. p. a.	o	o						
	{ Strep.	o	o						
	{ Coli.	o	o						
Boric acid, 4 per cent.	{ Sta. p. a.	xxxx	xxxx	xxxx	xx	xxxx	xxxx	xxxx	†
	{ Strep.	xxxx	†	o	o	xxxx	xxxx	xxxx	†
	{ Coli.	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	†
Sodium chloride, 10 per cent.	{ Sta. p. a.	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	†
	{ Strep.	xxxx	x	o	o	xxxx	xxxx	xxxx	†
	{ Coli.	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	†
20 per cent.	{ Sta. p. a.	xxxx	xxxx	xxxx	†	xxxx	xxxx	xxxx	†
	{ Strep.	xxxx	xxxx	o	o	xxxx	xxxx	xxxx	†
	{ Coli.	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	†
30 per cent.	{ Sta. p. a.	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	†
	{ Strep.	xxxx	xxxx	o	xxxx	xxxx	xxxx	xxxx	†
	{ Coli.	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	†
Thiersch's solution,	{ Sta. p. a.	x	o	o	o	xxxx	xxxx	xxxx	†
	{ Strep.	o	o	o	o	xxxx	xxxx	xxxx	†
	{ Coli.	o	o	o	o	xxxx	xxxx	xxxx	†

Solution used.	Bacterium.	Group I. Time of exposure, and result.				Group II. Time of exposure, and result.			
		2 min.	10 min	1 hr.	24 hrs.	2 min.	10 min	1 hr.	24 hrs.
Salicylic acid, ½ gr. in 1 oz.	{ Sta. p. a. Strep. Coli.	0 0 0	0 0 0	0 0 0	0 0 0	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	† † †
Marchand's peroxide of hydrogen, 25 per cent.	{ Sta. p. a. Strep. Coli.	x 0 x	0 0 0	0 0 0	0 0 0	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	† † †
Unmedicated urine, A ¹	{ Sta. p. a. Strep. Coli.	XXXX † XXXX	XXXX † XXXX	XXXX † XXXX	XXXX † XXXX	XXXX † XXXX	XXXX † XXXX	XXXX † XXXX	XXXX † XXXX
A.I. 6 grs. methylene blue in 8 hours = 18 grs. in 24 hrs.	{ Sta. p. a. Strep. Coli.	XXXX † XXXX	XXXX † XXXX	XXXX † XXXX	XXXX † XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX
A.II. 30 grs. salol in 8 hours = 90 grs. in 24 hours	{ Sta. p. a. Strep. Coli.	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX
A.III. 30 grs. boric acid in 8 hours = 90 grs. in 24 hrs.	{ Sta. p. a. Strep. Coli.	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX
A.IV. 30 m. winter- green oil in 8 hrs. = 90 m. in 24 hrs.	{ Sta. p. a. Strep. Coli.	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX
A.V. 12 grs. sacchar- ine in 8 hours = 36 in 24 hours.	{ Sta. p. a. Strep. Coli.	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX x	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX
B.V. Same as above	{ Sta. p. a. Strep. Coli.	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX
A.VI. 15 grs. benzo- ate of soda in 8 hrs. = 45 grs. in 24 hrs.	{ Sta. p. a. Strep. Coli.	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX xx	XXXX o xx	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX
B.VI. Same as above	{ Sta. p. a. Strep. Coli.	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX x XXXX	XXXX † XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX
A.VII. 50 m. oil of eucalyptus in 8 hrs. = 150 in 24 hrs.	{ Sta. p. a. Strep. Coli.	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX x	XXXX † †	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX
B.VII. Same as above	{ Sta. p. a. Strep. Coli.	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX o	XXXX † †	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX
A.VIII. 20 m. sandal wood oil in 8 hrs. = 60 m. in 24 hrs.	{ Sta. p. a. Strep. Coli.	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX † XXXX	XXXX † XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX
B VIII. Same as above	{ Sta. p. a. Strep. Coli.	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX o XXXX	XXXX † XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX

OBSERVATIONS ON SAMPLES OF GLYCERIN AND VASELINE.

One cubic centimetre introduced into gelatin yielded in one case a single colony of bacteria of a common air species, in another case two colonies. It seems most likely that these gained access to the gelatin during the manipulations necessary to prepare the mixture. The cultures were kept under observation for ten days.

¹ A only tabulated unless B differs in result.

Agar tubes were inoculated with small quantities of vaseline and placed in the incubator at 36° C. for several days. No growth resulted.

It appears, therefore, that the glycerin and vaseline were probably free from viable bacteria.

It will be noticed that in these numerous experiments clinical conditions have been imitated. In Group I. recent infection is simulated—*i. e.*, inoculation, the germ having been carried in by an instrument and lying free in the bladder, exposed to the most advantageous attack by the antiseptic. In Group II. the tissue involved in chronic inflammation is imitated, one layer of germs protects another. In actual life the tissue elements and tenacious mucus form a much better protective cover for the germs than could be well imitated in the laboratory. And it turns out scientifically, as it is proved to be practically, that the same reagent perfectly effective in Group I. is practically inert against the same germs in Group II.

This explains why by local treatment alone we may from the first avoid producing local suppuration, yet we cannot arrest local suppuration once started except by long-repeated effort, sometimes not at all. A glance at the first table also shows that while argentic nitrate is much more reliable than anything else in Group I.—bichloride is more reliable in Group II.—as might *a priori* have been inferred. The argentic nitrate coagulates the surface and protects the deeper germs, the bichloride solution has more penetrating power, and is, therefore, the more reliable the deeper the germ is situated.

The tables show mercuric bichloride up to 1 : 4000 to be absolutely effective (apparent deviations being doubtless due to errors of method and contamination) in Group I., while nothing less than 1 : 1000 can be depended upon in Group II., where the micro-organism has half a chance, and buried among the cells of a chronically inflamed mucous membrane the micro-organism surely has much more than half a chance.

Argentic nitrate up to 1 : 2000 is fully effective in Group I., entirely unreliable in Group II. In a comparative test nitrate of silver 1 : 1000 is better than mercuric bichloride 1 : 4000.

Boric acid is worthless in both groups, and so is salt up to a 30 per cent. solution.

Salicylic acid one-half grain to the ounce, Thiersch's solution, Marchand's solution, 1 part to 3 of water, are all reliable in Group I., useless in Group II.

Some recent experiments by Ali Krogus and Sam Chedenius go to show that the staphylococcus resists mercurial preparations longer than streptococcus or coli commune; the latter resists nitrate of silver the longest, streptococcus the least of the three.

The medicated urines were experimented with as follows:

Two apparently healthy persons having clear urine took the same drug

at the same hours on a given day. The next morning each urinated into a bottle without precautions, and the specimens marked A, B, etc., were sent for examination. They also were tested with the micro-organisms in Groups I. and II., just as the medical solutions had been tested. The substances used, with the doses taken and the hours were as follows:

A and B. Unmedicated urines.

A. I. and B. I. 2 grains methylene-blue at 2, 6, and 10 P.M., equivalent to 12 grains a day.

A. II. and B. II. 10 grains salol at 2, 6, and 10 P.M. (3j in twenty-four hours).

A. III. and B. III. 10 grains boric acid at 2, 6, and 10 P.M. (3j in twenty-four hours).

A. IV. and B. IV. 10 minims wintergreen oil at 2, 6, and 10 P.M. (3j in twenty-four hours).

A. V. and B. V. 4 grains saccharine at 2, 6, and 10 P.M. (24 grains in twenty-four hours).

A. VI. and B. VI. 5 grains benzoate of soda at 2, 6, and 10 P.M. (3ss in twenty-four hours).

A. VII. and B. VII. 10 minims Sanders' oil of eucalyptus at 2, 4, 6, 8, and 10 P.M. (Lydston), 100 minims in twenty-four hours.

A. VIII. and B. VIII. 10 minims sandal-wood oil at 6 and 10 P.M. (40 minims in twenty-four hours).

These substances were selected because they all, except perhaps the saccharine and the oil of eucalyptus, about which I am ignorant as yet, have undoubtedly a positive influence in moderating suppuration in chronic cases of kidney and bladder disease if properly selected, yet none of them cure, unless, perhaps, when persistently used in moderate cases. In profound chronic disorder they are next to valueless.

As was to have been expected, therefore, these substances do not exhibit in the laboratory any influence upon the growth of micro-organisms inoculated upon them and properly cultivated. The germ grows just as rapidly as in the urine of the same individuals not medicated when treated in the same way. Group I. and Group II. are alike negative. There is a faint show of beneficial influence (as to Group I.) in the urines medicated by benzoate of soda, by oil of eucalyptus, and by sandal-wood, but it is very slight. I did not test naphthaline, extolled by Couremenos, as the dose required is impossible in most kidney cases.

A further set of experiments, too elaborate for detail here, were made by Dr. Dunham with $\frac{1}{2}$ per cent., 1 per cent., and 2 per cent. solutions of phenol-sulphate of potassium—the salt which appears in the urine when salol is taken by the mouth. The result demonstrated clearly that while even a 2 per cent. solution did not kill those pathogenic bacteria which are the subjects of this study, yet even a $\frac{1}{2}$ per cent. solution showed a marked, though not very great inhibitive, action on their growth.

I cannot terminate this study without here laying emphatic stress

upon, and calling especial attention to, the value of abundantly flushing the urinary passages with bland mineral waters of the diluent variety, as a means of flooding out both pus cells and micro-organisms mechanically in many forms of chronic suppurative disease all along the urinary tract.

I know of no one single agent that possesses so much power for good. The enemy is decimated by this method of warfare and can be taken at a disadvantage. I refrain from speaking the names of the mineral springs that possess this power—and there are many of them—because the commercial spirit of to-day prostitutes such utterances.

The character of the mineral ingredient in the spring is not material. All that is required is that one may be able to stomach the water freely—to drink a gallon, two gallons a day, or more, and that the water shall not affect the bowels.

A number of such waters exist. Distilled water does not do the work, nor does rain-water. Ordinary clear spring-water fails. In selecting a mineral water it is only necessary to find a cheap one that may be consumed in vast abundance without a feeling of repletion—one that will pass rapidly through the kidney, having no influence upon the individual other than the diuretic one.

And in closing, I wish further to emphasize two prognostic points: one is the common error of believing that the presence of pus in the urine is capable of accounting for a considerable amount of albumin. One constantly hears this expression: "Albumin in the urine accounted for by the pus." Surely this is true of a trace of albumin—but only of a trace. An admixture of blood with the pus, or of blood-serum coming from an excoriated tumor in the bladder, or from an ulcer; this will account for albumin in quantity; but when there is no tumor, no stone, no ulcer in the bladder, there may be very considerable amounts of pus with barely a trace of albumin, and if under such physical conditions the amount of albumin be relatively large, it usually means pyelitis—implication of the kidney in interstitial or parenchymatous change, and by so much becomes a factor of importance in prognosis. Anything over $\frac{1}{2}$ of 1 per cent. by *weight* of albumin in urine, however purulent—if there be no blood in the specimen, no tumor, no stone, no ulcer in the bladder—becomes a factor in the question of prognosis when the point of the expediency of an operation comes to be considered. These cases may be assumed to have already reached a degenerative stage, and the chances of lighting up surgical kidney by operative interference below are relatively great.

The prognosis is, however, not worse—not so bad—as it is in the case of sclerotic kidney, with dilated ureter, etc., those cases in which there is active polyuria, worse at night, clear or nearly clear urine, with only a faint trace of albumin, or none at all. Such patients, after operation,

are apt to die intensely uræmic, passing quarts of urine, and sometimes with little or no fever.

I may briefly summarize my conclusions as follows:

1. Healthy urine is sterile.
2. Purulent urine is always microbic.
3. Microbic infection takes place from within the body by a number of methods in the course of disease; it is often brought about by instrumental manœuvres on the part of the surgeon.
4. A healthy organism and vigorous bladder may cope successfully with microbic invasion, and rid itself spontaneously, or with a little aid, of all damage arising therefrom—showing little or even no inflammatory response.
5. A suitable condition of the patient's soil is essential to the propagation and perpetuation of inflammatory phenomena upon the urinary tract—after microbic invasion.
6. This condition, intensified, by traumatism and physical weakness, notably of the degenerative variety, is most intense when there is vesical distention with atony, and when the ureters are dilated and the kidneys involved in the changes incident to tension below—namely, atrophy and sclerosis above, with or without surface catarrh.
7. Under these circumstances surgical pyelonephritis is most likely to declare itself as a result of microbic infection from below (occasionally from above)—in the course of suppurative disease or after operative interference.
8. Asepsis, antiseptis, and sterilization of urine are ends to be aimed at in genito-urinary surgery—but, like all other greatest goods, not yet attained in perfection. Much, however, can be done by local means in a prophylactic and curative way, little by internal medication, and possibly as much or more than by any other means by flushing the urinary passages with natural mineral waters.

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109 EAST THIRTY-FOURTH STREET.

GASTRO-ENTERIC RHEUMATISM.¹

BY HENRY M. LYMAN, A.M., M.D.,
OF CHICAGO, ILLINOIS.

IN his interesting description of nervous dyspepsia marked by an excess of hydrochloric acid in the gastric juice, Mathieu seems inclined (*Traité de Médecine*, vol. iii. p. 270) to ascribe the gastralgic and neuralgic pains of the disease to a local action of the excessive secretion upon the walls of the stomach. He recognizes the intimate relation

¹ Read before the Association of American Physicians, Washington, June 1, 1894.

between this morbid condition and neurotic and arthritic states of the body, but he does not sufficiently emphasize the fact that in many, if not in all such cases, we have to deal with a distinct and definite form of rheumatism that merits recognition and designation as rheumatic dyspepsia. This is just as much a local disorder of the nervous and glandular apparatus of the alimentary canal as rheumatic tonsillitis is a definitely localized manifestation of arthritic disease in the fauces, or as podagra is a local exhibition of gout in the feet. It is, accordingly, among members of the arthritic class of patients that this form of gastralgia and dyspepsia is encountered. It is in advanced life or among prematurely aged and exhausted subjects that this species of rheumatism is most commonly observed. Some of the worst cases occur among middle-aged ecclesiastics and other sedentary people with slender muscles, but with plenty of time and zeal for copulation, which for such persons constitutes the type of neuro-muscular excess. Some of these patients have suffered in earlier life with inflammatory rheumatism; some have had genuine articular gout; sometimes a tendency to obesity is evident; diabetes and polyuria occasionally appear. Premature whitening of the hair, early baldness, erythema, pityriasis, eczema, hemicrania, neuralgia, asthma, chronic bronchitis, lithiasis, various functional disorders of the kidneys, and varicosity of the hemorrhoidal, scrotal, and peripheral veins are of not infrequent occurrence. Sometimes the same patient exhibits a group of these diseases at once, or he experiences them singly and successively. Sometimes they are distributed among different members of the same family, so that while one is obese another will be diabetic, a third rheumatic, a fourth hemorrhoidal, and so on. But, with advancing years, the tendency to vague, wandering, neuro-muscular manifestations of the diathetic vice becomes more pronounced and inveterate. The grave disturbance of comfort that is thus produced, and the intolerable mental anxiety that may be caused by failure to recognize the true character of the disorder, give to rheumatic dyspepsia an importance greater than is usually assigned to it in the ordinary textbooks and treatises on medicine. Thus, Eichhorst, in his description of diabetes, gives a summary of the symptoms of gastro-enteric rheumatism as sometimes present in the course of the glycosuric disease, but he does not seem to recognize its independent character as a concurrent manifestation of arthritism, and he enumerates its symptoms as a part only of the symptomatology of diabetes. I desire, therefore, to call attention to this particular form of rheumatism affecting the nerves of the alimentary canal, because it is the cause of a great amount of misinterpreted and, consequently, unrelieved suffering. Its painful paroxysms are experienced when the stomach is nearly or quite empty, several hours after taking food. They are therefore suffered toward noon or in the latter part of the afternoon, or during the night—usually after mid-

night, though sometimes as early as ten o'clock in the evening, or as late as five o'clock in the morning.

The location of the pain is generally abdominal, usually occupying the epigastrium or the hypochondrium. It is not limited to a single focus, but seems to occupy a considerable territory as if by diffusion; or, to compare spatial sensations with visible objects, as if it were an ill-defined nebula instead of a luminous star. Sometimes pain is felt in the cardiac region; occasionally it is more evident in the muscles of the upper arms than in the trunk.

The character of the pain is very peculiar, and is of a nature that distinguishes it from other abdominal pains. It may be accompanied by tenderness of the epigastric region, particularly in the sternal third of the right rectus muscle; but such tenderness is distinct from the paroxysmal pain of gastralgia. Gastric pain is not increased by pressure or by movement. The patient may cough, sneeze, laugh, walk, or run without in any appreciable manner influencing the location or the character or the severity of the pain. Its intensity is not usually very great, though it may be sometimes horribly severe and attended with a feeling of fearful exhaustion. It is a dull, deep-seated, widely diffused, and persistent distress, quite different from the pain of ordinary gastralgia, hepatalgia, renal or intestinal colic, or peritonitis. It must not be confounded with the pains that occur in the gastric crises of *tabes dorsalis* or in chronic alcoholism, or in peripheral neuritis of any other kind. By the sufferer it is readily distinguished from pains that have their seat in the abdominal walls, and that sometimes occur in paroxysms which alternate with the paroxysms of gastro-enteralgia. In short, the pain of which I speak possesses all the characteristics of neuralgia affecting the ganglionic nervous system rather than the cerebro-spinal nerves of the body. Such pain, when severe, is more intolerable than ordinary peripheral neuralgia.

Rheumatic gastro-enteralgia exhibits a marked tendency to alternation with the neuralgias and myalgias that occur in other nerve territories. In this respect it conforms to the rule that governs the exhibition of vague, wandering, neuro-muscular rheumatism. The patient frequently complains of pain in the face and eyes, to-day; in the neck, throat, and shoulders, or in the heart, to-morrow; the abdominal viscera being next invaded. Sometimes the disturbance affects the cortex of the brain, causing insomnia instead of actual pain. When the gastric plexus of nerves becomes involved, the painful paroxysms are more regularly recurrent than in other parts of the body. In the corresponding enteric plexus it sometimes persists for a long period of time. Of this variety the dyspeptic and arthritic Samuel Pepys, of blessed memory, has left a graphic account in his immortal diary (September 27–October 13, 1663).

When the disturbance is thus shifted to the enteric plexus the distress

is usually less severe, but not less annoying, than when it invades the stomach alone. Sometimes the pelvic nerves are the seat of irritation, and the patient may suffer intensely with rectal or vesical agony. Sometimes the sexual organs participate in the general disorder, and the patient is harassed by prolonged and painful nocturnal erections. Like the analogous priapism sometimes experienced by gouty subjects, this condition soon yields to potassium iodide and to small blisters upon the perineum. In neurotic patients who are liable to pain as the concomitant of weather changes and barometric disturbances, it is not unusual to note an increased frequency of attacks during the damp and changeable weather of the spring and fall of the year. On such occasions, especially after severe fatigue, the gastric paroxysm is frequently accompanied by transient fulgurant pains like those of *tabes dorsalis*.

During the intervals between the paroxysms, especially if food and sleep have been procured, bodily comfort may be complete. But the close of gastric digestion, or the occurrence of bodily fatigue, or an exposure to cold damp air may be immediately followed by a return of pain. At first, the general health does not appear to be appreciably affected, but after a while loss of sleep, loss of appetite, and persistent mal-assimilation produce a condition of exhaustion. The patient becomes morbidly sensitive to cold; he is neurasthenic and quite incapable of mental or physical activity. Yet some of these sufferers present a florid appearance, and retain their usual weight. As a general rule, however, they gradually become anæmic and cachectic. Many of them are hypochondriacal; and some of the more intelligent class suffer severely through apprehension of malignant disease involving the stomach or other abdominal organs.

The diseases from which gastro-enteric rheumatism must be distinguished are:

Abdominal gout.

Rheumatism of the abdominal muscles.

Subacute peritonitis.

Chronic pancreatitis.

Chronic hepatitis.

Hepatic colic.

Renal colic.

Chronic catarrhal gastritis.

Ulcer of the stomach.

Carcinoma of the stomach and adjacent viscera.

From abdominal gout the disease may be distinguished by the history and habits of the patient.

From rheumatism of the abdominal muscles this disorder is differentiated by the absence of tenderness on movement or manipulation of the muscles. The concurrence of muscular tenderness with gastric pain

is not uncommon, and this renders the diagnosis more difficult under such circumstances. It then becomes necessary to note particularly the recurrent incidence of pain, and its association with an empty stomach.

From peritonitis a distinction is established by the absence of fever, tenderness, tympanites, and other symptoms of serous inflammation.

From chronic pancreatitis the disease may be distinguished by the situation and character of the pain, and by its recurrent coincidence with emptiness of the stomach.

The same thing is true of the difference between this gastric disorder and the various painful affections of the liver.

Biliary colic is irregularly recurrent, but it is frequently followed by jaundice and by fecal changes that are absent in gastro-enteric rheumatism. It, moreover, has no relation to the state of repletion of the stomach.

Analogous differences may be noted between the attacks of renal colic and the paroxysms of rheumatic gastralgia.

From the ordinary chronic catarrhal gastritis the disease differs in the greater severity and intermittence of the pain by which it is accompanied. Other symptoms of arthritism can be also discovered; and, if the intestines do not share in the disorder, the nutritive functions are but slightly disturbed.

From ulcer of the stomach the disease differs in the paroxysmal recurrence of pain that is not increased by pressure, or aggravated by taking food.

From carcinoma of the stomach it is differentiated by the absence of tumor; by the intermittent character of the pain; by the relief that is obtained on taking food; and by the overabundance of free hydrochloric acid in the gastric juice.

The pathology of the disease still remains as unsatisfactory as that of rheumatism in general. It seems probable that the symptoms are the result of toxic influences affecting the tissues as a consequence of hepatic and renal insufficiency. Just as in strictly gouty cases the agency of uric acid has been demonstrated, and as in uræmia certain definite symptoms exist, so it is more than probable that under certain conditions of retarded oxidation, toxic substances may be generated in the tissues, or taken up from the alimentary canal, and circulated with the fluids of the body to the painful detriment of the sensory apparatus of the nervous system. That the presence of these toxic substances is largely due to hepatic insufficiency is rendered probable by the good effects that follow the use of cholagogue stimulants and a proper regulation of the diet. Much better results generally follow a careful supervision of the alimentary canal and its appendages, than when the kidneys alone are addressed. Great relief from present suffering is obtained through free perspiration, but this measure is more palliative than curative.

Why the local manifestations of disorder are as varied and transient as they are, cannot be readily explained. It is probable that the different symptoms that are exhibited by different patients, and the variety of painful sensations that are experienced by the same individual, are due to differences in selective action and degree of saturation on the part of the toxins and the various tissues of the body; It is possible thus to explain the variations that intervene between trifling excitation and complete paralysis of sensation; but the intermittent and erratic character of the attacks is not so easily interpreted. When the seat of disturbance is in the muscular layer of the gastro-intestinal wall, the phenomena of cramp or of paralysis are most conspicuous. If the secretory nerves and the corresponding glands are excited, pyrosis, hyperchloridria, or diarrhœa may be experienced. If, as occasionally happens, the peritoneum be invaded, a most excruciating and dangerous form of peritonitis follows. But if the great network of ganglionic nerve fibres alone be involved, the symptoms of gastro-enteric nervous rheumatism are displayed.

The discovery that when this form of rheumatic pain affects the gastric plexus there is present an excess of free hydrochloric acid in the gastric juice, suggests the thought that here is a condition of the organ analogous to that of an over-taxed muscle that is painful after fatigue. We know that the disintegration of muscular tissue during work sets free an excess of sarcolactic acid in the muscle. So long as this is retained in the muscular tissue during the partial stagnation that may occur after the cessation of exertion, the muscular nerves are rendered uncomfortable, and the patient complains of a species of soreness in the affected part. But when the excreta of the muscle have been removed by rest, or by massage, or a warm bath, complete relief is experienced. If, however, under such circumstances there be exposure to wet and cold, especially if the patient be arthritically disposed, elimination is not accomplished, and a form of inflammatory departure from the normal standard of nutrition is set up. This, however, does not explain the periodically recurring sensations of pain that are experienced when the stomach is empty. It seems probable that they result from a condition of the gastric mucous membrane that retards the absorption of gastric juice at the close of digestion in the stomach, so that the excess of hydrochloric acid acts upon the nerves of the hollow gastric muscle, in a manner very like what is experienced in the locomotive muscles of the body when fatigue and stagnation follow a period of over-exertion and over-production of sarcolactic acid. It is also more than probable that in the conditions of retarded oxidation and faulty nutrition that characterize the arthritic diathesis, the gastric juice may contain other noxious agents beside an excess of hydrochloric acid.

The urology of these cases must be postponed for the present. Its

indications are exceedingly variable and very obscure. The chemistry of the urine in erratic rheumatism is yet to be written.

The treatment of gastro-enteric rheumatism does not differ from that of other varieties of neuro-muscular rheumatism. Like other cases of intense neuralgia, the severest cases of gastralgia and enteralgia require the palliative exhibition of opiates. But, fortunately, the ordinary, commonplace forms of the disease are more easily relieved. When the period of distress occurs three or four hours after the last meal, it may be promptly arrested, in many cases, by a crust of bread or a glass of milk, or a cup of hot water. The patient, however, must be cautioned against reliance upon such measures alone, for they sometimes aid in effecting dilatation of the stomach. I once saw a middle-aged man who had accidentally discovered the palliative quality of milk, and who, consequently, carried in his pocket a quart bottle of milk, from which he drank whenever he felt a pang of pain. This had resulted in an enormous dilatation of the stomach without cure of the disease. Slightly alkaline liquids, such as lime-water, etc., are useful. When the gastric juice contains an extraordinary quantity of hydrochloric acid, it may be necessary to give sodium bicarbonate in scruple doses, three or four times a day. Still better, because more curative, is the sodium salicylate, which should be given in ten-grain doses every three hours until the tissues are saturated with the drug. Salol may be used with advantage if the stomach objects to the salicylate. Both of these preparations are useful also by reason of their active cholagogic property.

Chief among the remedies that are both curative and palliative is olive oil. The patient should take half an ounce or an ounce of salad oil whenever the stomach is empty. This also relieves the constipation that is so commonly present; and by liquefying the bile renders its discharge more easy and certain. In cases of obstinate constipation, it is desirable to employ laxatives that stimulate the excretion of bile:

R.—Podophyllin.	.	.	.	.	.	.	gr. $\frac{1}{10}$.
Fel. bovin.	}	.	.	.	.	.	āā gr. j.
Euonymin.		.	.	.	.	.
Ext. hyoseyam.		.	.	.	.	.

Sig.: Pil. tal. t. i. d. capiat.

The chronic character of the disease renders necessary a resort to alteratives in many instances. Small doses of mercury (hydrarg. biniodid., gr. $\frac{1}{100}$) three times a day; potassium iodide with colchicum:

R.—Pot. iodid.	.	.	.	.	.	.	5j.
Vin. colchici sem.	}	.	.	.	.	.	āā 5j.
Aq. cinnam.		.	.	.	.	.

Sig.: Gtt. x, t. i. d. capiat.

—together with tonic doses of quinine or of elixir calisayæ, must be administered for many successive months. Sometimes a course of nitric

acid, or of the ammoniated tincture of guaiac, is very beneficial. Occasional mercurial purges should not be neglected; and flushing the colon with hot water is often a means of great relief. The late Mr. Pepys extols the efficacy of large clysters composed of warm ale in which butter and sugar had been dissolved. It is probable that the popularity of hot toddy at bedtime has a similar foundation among old people.

Of great importance is the regulation of the diet. If the patient has been a full feeder, florid in complexion, and inclining to the gouty variety of arthritism, he should be placed for a time on vegetable food, with little or no meat. Mineral waters, of the Vichy and the Carlsbad type, will be found useful in such cases. But this regimen must not be carried too far. Insufficient alimentation will surely aggravate the paroxysmal attacks. One of my clients, who frequented a notorious downtown lunch counter, used to claim that for a fifteen-cent meal at noon he could be sure of gastralgia at five o'clock, while for twenty cents he could purchase perfect immunity during the whole day. Elderly patients who are thin and neurotic often get help from small quantities of brandy or whiskey after meals; but this remedy must not be taken habitually, for in the long run arthritic subjects are very intolerant of alcohol. Debilitated patients who are easily exhausted, and who crave food at short intervals, should have a nitrogenous diet, with very little saccharine and starchy food. Such patients can sometimes eat a hearty dinner, with pickles, cheese, and nuts, without discomfort; but the experiment should not be often repeated. When fats disagree, causing acid eructation, etc., they should be eliminated from the dietary; but when they are digested, they exercise a beneficial influence. It is probable that the good effects of cod-liver oil in many cases of chronic rheumatism may be thus explained.

Frequent warm baths are exceedingly grateful—hence the benefit derived from the various hot springs by people who will not bathe at home. The best result from bathing is obtained from its association with massage. The patient should rise early, take a very light breakfast, then enter the bath, and be thoroughly soaked and manipulated at a temperature of 90° to 95° F. Another light meal may then be eaten, and the patient should remain in bed until noon, the latter part of the day being devoted to exercise in the open air and to general recreation. Alcohol, tobacco, tea and coffee must be forbidden, for they are not compatible with arthritism, because they retard those processes of oxidation that need acceleration in every possible way. Great fatigue of mind and body must also be avoided, for there is a notable connection between fatigue and every explosion of rheumatic pain.

THE MANAGEMENT OF FEVERS, AND PARTICULARLY OF
TYPHOID OR ENTERIC FEVER.

BY J. BURNEY YEO, M.D., F.R.C.P.,

PROFESSOR OF CLINICAL THERAPEUTICS IN KING'S COLLEGE, LONDON, AND PHYSICIAN TO
KING'S COLLEGE HOSPITAL.¹

SCIENTIFIC and rational medicine requires that our therapeutic ideas should be in accord and on a level with our pathological knowledge.

It is already a considerable thing that our minds should be possessed with a correct idea of the indications to be fulfilled in the management of any particular disease, even should the means of giving effect to the idea not yet be at our command.

But true and clear ideas on the subject will, in all probability, lead, in course of time, by such observation and experiment as they will suggest, to the realization of a practice consistent and in harmony with them.

Some years ago I called attention to the importance of the "antiseptic" or "antitoxic" idea in the treatment of pulmonary phthisis. It was received, in some influential quarters, with coldness, if not with opposition; but, as a result of the observations and experiments this idea suggested, our treatment of pulmonary tuberculosis has been greatly modified in recent years, and has now been brought into more accurate relation with our pathological knowledge, to the greater credit of medicine and to the notable advantage of humanity.

Just as our fresh knowledge as to the nature of tuberculosis aroused in our minds fresh and more correct ideas as to the indications for its treatment, and then, in course of time, to consistent modifications in our practical measures, so also with regard to specific fevers, our recently acquired knowledge of their nature and mode of origin imposes on us ideas as to their therapeutic management consistent and on a level with recent pathological discoveries.

In order to avoid discursiveness and to keep this paper, as nearly as possible, within the prescribed limits, I propose to examine the treatment of only one of these specific fevers, the one with which I am best acquainted, viz.: typhoid or enteric fever, and, for my present purpose, to regard it as a type of the class of diseases to which it belongs.

It is now generally accepted that this disease, as well as other specific fevers, is of bacterial origin, and the special bacillus of typhoid fever has been repeatedly described and cultivated. It is also an accepted doctrine that these micro-organisms produce substances within the body (toxalbumins and ptomaines) which act as poisons on certain of the

¹ This contribution was written for the International Medical Congress at Rome, but was not read owing to the unavoidable absence of the author.

tissues, and by their toxic action excite the morbid manifestations which characterize these diseases.

These poisons act especially on the nervous, muscular, and glandular tissues in the development of those characteristic symptoms of which pyrexia or fever is one.

It is also well-known that there are many substances which, outside the body, will arrest the growth and put a stop to the activities of these micro-organisms, while there are other conditions, and notably the presence of substances in a state of putrefaction, which greatly promote their growth and stimulate their activities.

In what manner precisely the pyrexia is excited it is somewhat difficult to say; whether by the direct irritation of the cells of the organism, and especially of the muscular tissue cells, or by a toxic action on the heat-centre in the brain is uncertain. But we certainly possess many agents which are capable of controlling more or less the pyrogenic effect of these infective organisms.

The preceding considerations, which could be largely amplified, justify the following conclusions:

1. That our recently acquired knowledge as to the nature and causes of specific fevers requires a modification in the therapeutic conceptions and indications applied to their management, and

2. That the antagonism of pyrogenic and other poisons produced within the body by the micro-organisms which give rise to these fevers is the most essential therapeutic indication to be applied in their treatment.

This is the "antiseptic," or, with strict accuracy, the "antitoxic" idea as applied to the treatment of fever.

The limited scope of this paper will not admit of my attempting to estimate the practical value of the methods that have been suggested for the purpose of procuring immunity from these infective diseases; my purpose is to consider the influence of direct antagonists, and this appears to me to be of greater practical interest in connection with the treatment of a disease like enteric fever than methods of inducing immunity.

It seems to me that attempts at inducing immunity are scarcely applicable to this disease, so far as our present knowledge extends,¹ the cases of which usually come under treatment some considerable time after the introduction of the poison into the system. And but little success has attended the efforts to control the course even of a disease like tetanus by supposed immunizing agents when the cases have been severe or of some standing.

But the two methods are not in any sense opposed to one another,

¹ "On ne se soumettra pas volontiers à ces vaccinations quand on sait que l'on possède beaucoup de chances pour ne pas contracter l'infection contre laquelle on veut vous prémunir." Charrin: *Traité de Méd.*

and I would here plead that they should be regarded as of, at least, equal importance in the study of the treatment of specific fevers.

Those who, like myself, have been withdrawn by the claims of practical clinical work from laboratory researches look to those who have still the leisure and the inclination to prosecute such researches, in the interests of practical medicine, to continue their labors as much in the direction of the discovery of means of directly antagonizing the toxic influence of infective organisms as in the direction of discovering methods of inducing immunity; and for the present I believe the former are likely to be of more practical help to us in our clinical therapeutics than the latter.

This brings me to the practical and chief contentions of this paper, viz.:

That already the results of clinical observation give promise of fruitful conclusions in the direction of obtaining effective agents for antagonizing the morbid activities of the infective organisms of specific fevers, and

That the average course and characteristics of these fevers can be, and have been, favorably modified and controlled by such antagonists.

I have myself put on record, from time to time, certain favorable results which have been observed in my own hospital and private practice from the application of antitoxic or antiseptic measures in the treatment of enteric fever; and I may say at once that as my experience widens I become more and more convinced of the value of such measures and of the practical necessity of continuing to work in this direction, so that we may improve upon our present resources, or develop them in greater perfection.

But before I refer to my own personal experience it is only right that I should indicate very briefly the recorded experience of others in this direction.

In England, Dr. Wilks, of Ashford, in Kent, was, so far as I know, one of the earliest to call attention to the wide application of an antiseptic agent in the treatment of a great number of cases of enteric fever. This was in 1870. A compound of sulphur—sulphurous acid—was the agent he employed. He gave it in 170 cases within a period of fourteen months, and he only had one death, and that patient was a habitual drunkard who would not take his medicine. This seems a very remarkable and almost incredible result; but we must remember that these cases occurred in private practice in an epidemic form, and that treatment was doubtless begun very early in most of the cases; whereas in hospital practice it is rare to see a case before the fourth or sixth day, and many are not seen until the tenth day or later. And it must be noted that the remedy was applied very thoroughly and to saturation of the system.

It was given until the patient complained "of tasting, smelling, and feeling like sulphur or lucifer matches, or, in the case of infants, until they actually emit an odor of the gas from their skins and breaths."¹

Prof. Bouchard, who has insisted on the value of maintaining *intestinal* and attempting *general* antiseptics in this disease, with whose conclusions I am entirely in accord, has advocated the use of naphthol as an intestinal antiseptic and quinine as a general one. Dr. Tessier and many others also advocate the use of naphthol. Prof. F. P. Henry,² of Philadelphia, testifies strongly to the value of *thymol*. "The typical symptoms of typhoid fever will rarely develop," he says, "if thymol is administered during the first week of the disease."

Prof. Charteris and Dr. Sloan advocate the use of a pure form of carbolic acid of a higher melting-point than the ordinary acid; and in the way they administer it they³ find it cuts short the fever, "no grave symptoms ensued, and the process of recovery was quick and attended by no wasting."

Dr. Waugh, of Philadelphia, uses sulpho-carbolate of zinc. He treated over one hundred cases in this way without a death.

Tortchinsky⁴ has obtained excellent results from the use of *boric acid*; Kesteven,⁵ of Brisbane, from *oil of eucalyptus*.

Maillart⁶ finds the administration of large quantities of pure water, even as much as sixteen litres per diem, of great value, for its cleansing antiseptic properties. He believes it washes away the toxic products of bacillary action through the renal filter. If those large quantities cannot be taken by the mouth, he suggests subcutaneous injection, or rectal injections. It will be seen hereafter that an essential part of my method is the free consumption of pure water. Maillart applied this method in fourteen cases and lost one case only.

Shuell⁷ has practised irrigations of the colon by copious injections of water rendered antiseptic by boiling—as much as two quarts at a time, his object being to promote intestinal antiseptics by removing all decomposing substances from the colon. The result of this injection is at first the evacuation of foul-smelling feces intermixed with scybala. If such irrigations are used early, the disease is rendered "comparatively light."

Dr. Fritz Hölscher, of Mulheim, reports the treatment of sixty consecutive cases of typhoid with guaiacol carbonate (15 to 30 grs. twice a day) without a death. He refers the beneficial result to intestinal antiseptics, and states that it removes the poisonous products of bacterial activity. "In the greater number of infectious diseases the art of the

¹ British Medical Journal, 1870.

² Hare's Manual of Practical Therapeutics, vol. ii. p. 307.

³ British Medical Journal, December 31, 1892, and March 25, 1893.

⁴ See my Manual of Medical Treatment, vol. ii. pp. 641, 642.

⁵ Practitioner, May, 1885.

⁶ Revue de Médecine, November, 1893.

⁷ New York Medical Journal, September 2, 1893.

physician must limit itself chiefly to the elimination from the system of the toxic substances formed by the pathogenic microbes."

It is not to be supposed that the concurrent testimony of all these highly competent observers is untrustworthy, and although they may have adopted widely different agents in carrying out their ideas, the *idea* is the same, viz.: the application of an "antiseptic" or "antitoxic" agent to counteract and diminish the activity of microbic infection, or to neutralize the effects of the toxins produced by the agency of these micro-organisms.

The aim of all these efforts has been to produce *intestinal antiseptis*, an indication of undoubtedly the greatest importance. But we should, I consider, attempt more than this, and endeavor to produce also an *antitoxic* effect on the blood and the tissues, and this is, I think, possible by the use of such measures as I advocate. That future researches in this direction may provide us with better ones, I am willing to hope. Hölscher says: "From a chemical point of view there is no doubt we ought to discover for each of the toxic albumins produced in the different infectious diseases a medicament which would fix itself upon and eliminate from the blood these toxic albumins."

My first attempts in this direction in the treatment of enteric fever were made with *sulphurous acid*, the antiseptic agent employed with so much success by Dr. Wilks, and it seemed to have a remarkable effect in modifying the temperature curve and in causing a decided reduction of the pyrexia. This is well shown in a case I published, in which this remedy was given, and which ended fatally from hemorrhage and perforation.¹

I had, however, been long impressed with the great efficacy of free chlorine as an antiseptic agent in septic conditions—or, rather, a mixture known as *euchlorine*, and containing free chlorine, as obtained by the action of strong hydrochloric acid on powdered potassium chlorate, especially in the treatment of the grave forms of throat ulceration occurring in cases of *scarlatina maligna*.

I therefore determined to use this mixture in the treatment of typhoid fever, and to give quinine in combination with it, believing, as Prof. Bouchard has maintained, that quinine acts as a *general* antiseptic in this disease.

Chantemesse² considers he has proved that quinine exerts a decided antiseptic power over the microbe of typhoid fever.

The mixture I use is made in the following manner:

Into a twelve-ounce bottle put thirty grains of powdered potassic chlorate, and pour on this 60 minims of strong hydrochloric acid. A greenish-yellow gas is at once liberated. Close the bottle with a cork and agitate the mixture gently until the bottle is filled with the gas, then

¹ Practitioner, June, 1882.

² *Traité de Médecine*, vol. i., p. 787.

pour water into the bottle, little by little, closing the bottle and well shaking, at each addition, until the bottle is filled.

We have in this solution several antiseptic agents all in a *state of solution*, and readily absorbable, which is one of its great merits over antiseptics not in solution; free chlorine, hydrochloric acid, potassium chlorate, and probably one or two by-products. In twelve ounces of this solution I cause twenty-four to thirty-six grains of quinine to be dissolved, and some syrup of orange-peel added to make it more agreeable to take; and of this, to adults, I order one ounce to be given every two, three, or four hours, according to the severity of the case.

I have adopted this method of treatment of all cases of enteric fever that have come under my care, both in my service in King's College Hospital and in my private practice during the past ten years, and I have had uniformly good results except in two cases; in one of these the case was not seen by me, nor accurately diagnosticated, till the second week of the fever, and the treatment was only then begun, and this patient died early of pulmonary complications; the other case was not seen by me until the end of the first week, when the case had already assumed the gravest aspect of a very intense infection—the patient had also the shock of hearing that her mother and sister were lying dead of the same disease—this patient died during the second week after a very large hemorrhage. The agminated glands along the whole of the lower part of the ileum, and the solitary glands of the large intestine were the seat of most intense and extensive ulceration.

The cure of every disease must necessarily be *conditioned*; the conditions of possible cure must exist at the time the remedy is applied. There will, from time to time, appear certain cases of typhoid fever which, either from abnormal intensity and virulence of the infective agent, or from the antecedent state of the organism invaded, or from the excessive sensitiveness of the tissues attacked, will, if not at the very outset, yet shortly after, pass into a morbid state, in which the conditions of cure no longer exist, no matter what remedy may be applied. This very obvious truism is frequently overlooked in estimating the action of remedies which are sometimes “tested,” as it is termed, in cases hopeless from the commencement, and efficient remedies are accordingly discredited, and unjustly so. It should be remembered that there occur, occasionally, fierce and destructive conflagrations which water will fail to extinguish or control, yet water is none the less an extinguisher of fire.

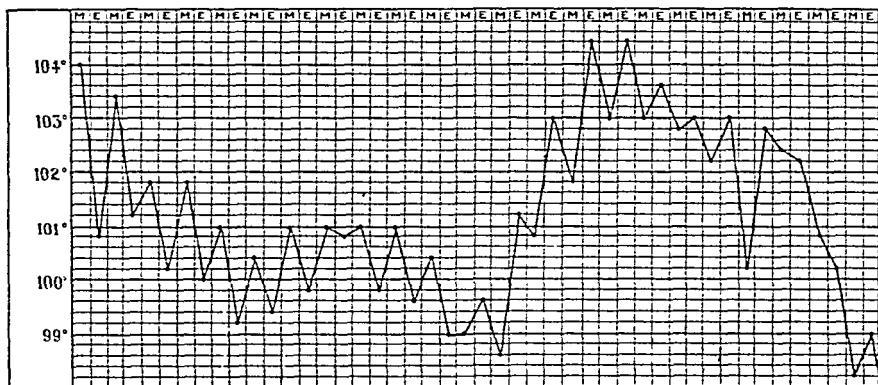
I present the temperature charts of a few of my recent cases to show the influence of the treatment over the pyrexia.

The details of other typical cases I have already published.¹

Let me call attention to some of the effects of this treatment, which may be observed in most cases in which it is applied.

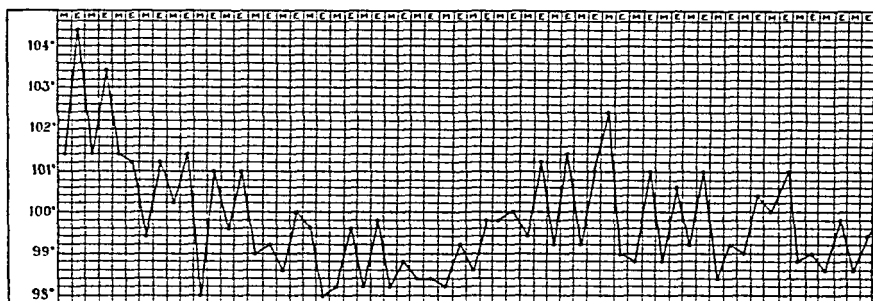
¹ Treatment of Typhoid Fever.

CHART I.



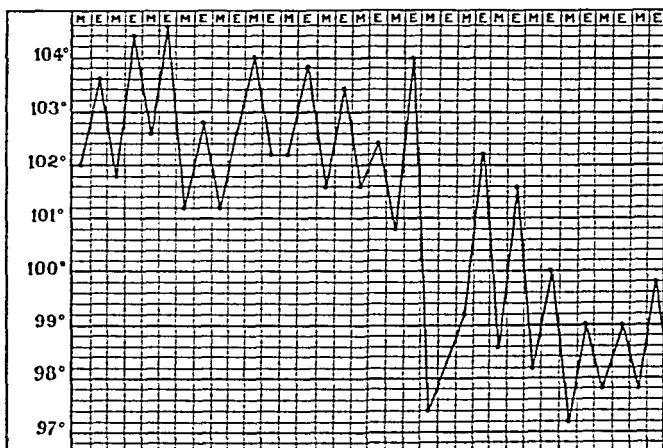
Remarkable effect on pyrexia. Rise of temperature on discontinuance of remedy.
Renewal of treatment and final decline of fever.

CHART II.



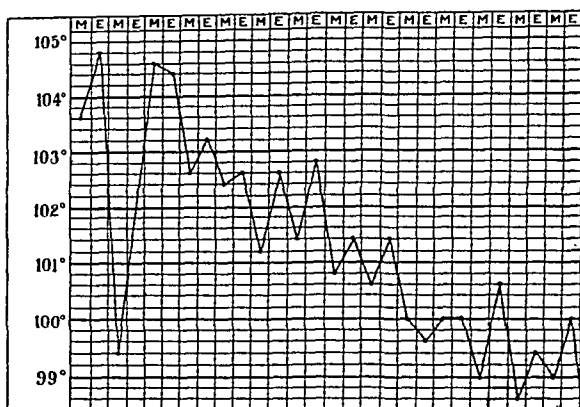
Control of pyrexia, but mild relapse. Utero-gestation; abortion at seventh month.

CHART III.



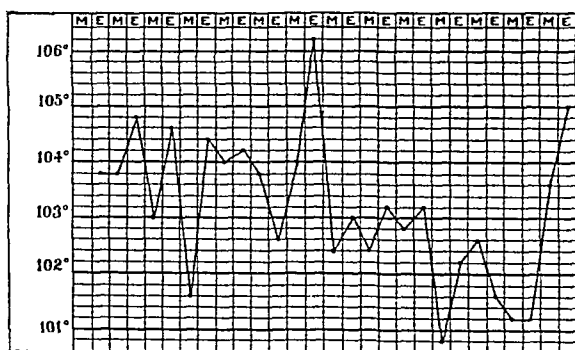
Marked abbreviation of febrile period.

CHART IV.



Remarkable influence on course and duration of pyrexia. The first considerable fall was due to an ice-pack applied before I saw the case, after which the temperature again rose rapidly.

CHART V.



Same control of pyrexia, but death from large hemorrhage.

1. There is a remarkable cleaning of the tongue and mouth. The aspect of the tongue in cases so treated is frequently quite unlike the usual tongue of enteric fever.

2. The foul putrefactive odor of the feces is rapidly removed, if the remedy be given sufficiently often and in sufficient quantity, for this fluid and perfectly soluble antiseptic certainly reaches and passes through the small intestine, as the nurses constantly report the odor of chlorine in the alvine evacuations. This surprised me at first, until I became aware how excessively defective gastro-intestinal absorption is in these cases—a circumstance to which I shall again allude. As but comparatively little of the food given is absorbed, the chlorine mixture blending with the food is carried along the intestinal canal, disinfecting as it goes, and the fluid feces when passed are found to retain the odor of free chlorine!

3. Another important effect of this treatment is a sustained depression of the febrile temperature—a continuously favorable effect on the

pyrexia. The pyrogenic toxine seems to be under control, or continuously neutralized, or excreted.

4. In certain cases, especially in young subjects, and if the treatment has been begun quite early in the case, the average course of the fever appears to be notably shortened.

5. There is another very striking effect of this treatment, and that is that the patients seem subjectively so much less disturbed by the fever poison. Their physical strength and intellectual clearness are far better maintained than by any other method of treatment with which I am acquainted. In many cases the nervous system shows none of the signs of febrile intoxication which we have been accustomed to see.

Finally their convalescence is more rapid and complete, and troublesome sequelæ, so far as my experience has extended, are unknown.

The effect upon the pyrexia of this "antitoxic" method of treatment has appeared to me to be very different from that of the so-called "antipyretic" drugs; these produce, usually, an almost immediate fall of temperature, often with profuse perspiration and considerable depression of the action of the heart; they have, as it were, a wholly independent action of their own; not so with the quinine and chlorine solution—the effect on the temperature is slowly developed (with such *moderate* doses of quinine as I advocate), and it may take forty-eight hours before any very notable effect on the temperature is produced, indeed, the temperature may actually rise a degree, or even more, in the first twenty-four hours of its administration, which appears to me to indicate that the antipyretic effect is due to a *general* antagonizing influence on the pyrogenic poison in the tissues, rather than from any immediate or direct effect on the heat-regulating mechanism.

My own observations and experience with this method have been corroborated by other entirely independent observers.

Dr. O'Connor, of Buenos Ayres, has sent me a message that he has applied this method of treatment in one hundred consecutive cases of typhoid fever, and has only had two deaths.

Dr. James, of Humansdorf, Cape Colony, writes to me that "it has yielded splendid results in typhoid fever" in his practice.

Dr. Edwards, of the Bootle Fever Hospital, writes to the same effect, and similar testimony has been volunteered by many other medical men at home and in the colonies.

But it is the truth of the *general idea* that I am most concerned here to establish rather than any particular method of carrying it out.

Extraordinarily good results have been recently claimed from the administration of guaiacol carbonate in typhoid fever, and it is a remarkable circumstance that the success attending the use of this substance in another bacillary infection, *i. e.*, tuberculosis, should have suggested its use in typhoid. It shows the value of the *general therapeutic idea* in promoting progress in practical medicine.

It is well known that in the presence of putrefactive processes bacillary action is remarkably stimulated, and I am not aware that it has hitherto been pointed out that the intestinal lesions of typhoid fever offer a remarkable illustration of this fact. The glandular infiltration, inflammation, and ulceration observed in the walls of the ileum begin *just where the intestinal contents begin to undergo putrefactive decomposition*, and they become more and more intense as we descend to the ileo-cæcal valve. They are also observed in the solitary glands of the colon, but here the fluid contents of the bowels are not long retained in contact with the mucous membrane.

If we can restrain *early in the disease* these putrefactive changes in the intestine we may confidently hope to restrain the morbid activity of the typhoid bacillus, and thus we see how the production of *intestinal antisepsis* becomes an urgent and early indication in the treatment of these cases. We are greatly indebted to Prof. Bouchard for pointing out this indication so clearly and forcibly as he has done. A calomel or other purge in the initial stage of the fever (if diarrhoea does not exist), and washing out the large intestine twice daily with naphtholated water enter into Prof. Bouchard's (and my own) conception of intestinal antisepsis.

But this intestinal antisepsis cannot be carried out thoroughly without great consideration, care, and observation in the matter of *feeding* the patient. We must adopt a method of feeding which shall by no possibility leave a bulky residue of unabsorbed material to undergo putrefactive changes in the lower part of the small intestine, and by its presence *there* excite and maintain diarrhoea and provoke an extension of the ulcerative and inflammatory changes dependent on bacillary infection of the intestinal glands.

For this purpose we must note carefully what digestive and absorptive activity exists in each individual case. In many this will be found to be *extremely small*! Let this be well noted, for the neglect to do so is responsible for much avoidable mischief. The fault usually lies in the too free administration of milk. I have again and again seen milk break down utterly as a food for typhoid patients. In some cases I have seen it vomited as a firm, cheesy mass soon after it has been taken into the stomach, and in many others I have observed the maintenance of diarrhoea to be dependent upon the irritation of masses of milk curd passing through the inflamed and catarrhal intestine. These are obvious instances of the failure of milk as a food. There are others, far more common, in which it will be found, if the alvine dejections be carefully examined and estimated, that nearly, if not quite all, the casein of the milk taken as food is passed undigested, not as coarse curds, but as a fine deposit from the so-called "pea-soup" stools. I have again and again proved this, and shown that the amount of milk absorbed is in many cases remarkably small; and to persist in giving food that is not absorbed is to persist in introducing decomposable material into the intes-

tine when we wish to keep it free from putrefactive decomposition, and to maintain diarrhœa when we wish to keep the bowels at rest. It is the popular *mania* for feeding which induces us to give food when it simply passes as an irritating decomposing substance along the intestinal tube. Remember that it is useless and injurious in these cases to give food that is not absorbed. Estimate accurately the absorptive capacity of the patient. If he cannot absorb milk at all, give him some other food. If he cannot absorb four pints in the twenty-four hours, give him two, and if he cannot absorb two pints, give him one, and if he cannot absorb more than one-half a pint, give him one-half a pint.

Give all food *very dilute*; milk should be diluted with twice its bulk of water. We wish for antiseptic and eliminative purposes to give as much pure water as the patient will drink—give it then as a diluent of his food. When milk, however small in quantity, absolutely disagrees, very dilute, freshly-made, clear soups, in the making of which some *aromatic* herbs have been used, is the best substitute. Dilute albumin water, made with the white of an egg, is also then serviceable. Give whatever intestinal antiseptic you may be using at the same time as the food, so as to keep it from putrefactive decomposition. The antiseptic principle, when applied to the feeding of typhoid patients, necessitates then the administration of food in a dilute liquid form—food *that remains liquid in the body* as well as *outside* it, and that is not prone to be suddenly rendered solid by chemical change, as undiluted milk is. I am not suggesting that milk should not be used in a diluted form whenever it is found to be well tolerated and freely absorbed, but I would urge the necessity of exchanging it for other food when it is seen that much solid though finely reduced casein is passing in the motions.

As to the use of alcoholic stimulants, I believe the general tendency is to give them too early and in too large quantities. They are needed, in moderation, toward the end of the most severe and protracted cases; but the less severe cases do better, I think, without any. I have used, in association with moderate quantities of alcohol, in protracted cases, with marked cardiac debility, *infusion of coffee* with, it has seemed to me, more marked and sustained stimulation of the heart than when alcohol alone has been given. We have too much neglected those excellent cardiac stimulants—tea and coffee—in the treatment of fevers.

We must not expect that success will uniformly attend the application of the method of treatment I have been advocating—*i. e.*, an antitoxic or antiseptic method—unless we are enabled to apply it *early* in the disease. Every day, every hour that is lost in allowing the products of the infective microbe to be diffused widely through the system will tend to lessen the efficacy and minimize the effects of our medicinal antagonists.

If time is lost at the onset, the virus becomes diffused, and an intense

general infection may occur; and then, if the individual tissues are especially sensitive to the virus, no remedies may be able to prevent the occurrence of a fatal lesion, such as excessive hemorrhage from deep ulceration or perforation. One great advantage in establishing complete intestinal antisepsis, and in attempting for this purpose to give just as much food as will be absorbed and no more, is that we are enabled, in the advanced period of the disease, to keep the intestinal canal *at rest*, a most important indication in connection with the intense ulcerative processes which are usually present there in severe forms of typhoid. I am accustomed to give for this purpose small enemata of two or three ounces of starch mucilage, each containing about ten grains of tannin and five grains of Dover's powder. This not only allays intestinal irritability, but it is useful in quelling nervous excitement also. But I shall not dwell here on further details of management, as I have fully considered these elsewhere. (See my *Manual of Medical Treatment*, vol. ii., part ix., chap. 3).

I object to the free use of *depressing* antipyretic agents merely as reducers of temperature, as they simply attack a symptom, and they should be reserved exclusively for those cases in which the symptom they attack is for the moment the *all-important* symptom of the disease, viz., for states of hyperpyrexia. For this purpose I occasionally, but very rarely, use a small dose of phenacetine (five grains). Even in such small doses I have been concerned at the great cardiac depression it at times occasions. We should not, without much hesitation, give to a sick and debilitated man drugs that would make a sound and strong man seriously ill.

With regard to the routine cold-bath treatment of typhoid, for my own part, I am disposed to leave it, almost without comment, to those who like it. Personally I have seen calamitous results occasionally follow its indiscriminate application. I do not doubt its essential value in certain cases of hyperpyrexia. It, however, attacks a result of the disease only; it is not wholly free from risks of its own, as I can from my own experience testify; it is difficult to apply continuously, and unless applied continuously, often fails to reduce temperature, except for a brief period. As a tiresome and inconvenient method of treatment, its great claim to adoption was the superior results it was stated to yield. The method I advocate has yielded in my own practice and in that of others better results, and I therefore prefer it.

In this necessarily brief paper I have been compelled to pass over unnoticed many relevant matters. I have not attempted to determine the precise manner in which "antitoxic" or "antiseptic" remedies act: whether by weakening the virulence of the invading organisms by modifying the fluids in which they live, or by strengthening the power of resistance or of attack in the cells of the blood and tissues, or in some

other manner. My chief object and desire has been to place before this Congress a *therapeutic idea*, consistent and in harmony with our pathological knowledge, to point out the success which has attended its practical application in the treatment of one of the most prevalent and widely diffused of the specific fevers, and to obtain, through the sanction and approval of this Congress, its further development and adoption.

APOPLEXY IN ITS RELATION TO THE TEMPERATURE OF THE BODY, WITH A CONSIDERATION OF THE QUESTION OF HEAT-CENTRES.¹

BY CHARLES L. DANA, M.D.,

PROFESSOR OF NERVOUS AND MENTAL DISEASES IN THE NEW YORK POST-GRADUATE MEDICAL
SCHOOL; VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

THE subject to which I wish to draw your attention to-day is that of the relation of apoplexy to the bodily temperature. By the term apoplexy I include both intra-cranial hemorrhages and softenings due to embolism or thrombosis. For several years I have been paying special attention to the effects of these insults to the brain upon the elevations of the temperature of the body, and I have accumulated sufficient material to justify me, I hope, in presenting some conclusions regarding the matter. The data which I have used in the present paper consist of observations upon over eighty cases of apoplexy in which an autopsy was made, and the nature and seat of the lesion noted. The points which I have sought to clear up in a study of these records have been: First, the general bodily temperature directly after an apoplectic stroke, and the later course of this temperature, if such is found to exist. Second, the temperature of the two sides of the body as compared with each other, and with that in the rectum. Third, the relation of the temperature change to the nature of the lesion, and, fourth, its relation to the seat of the lesion, including in this last a brief discussion of the subject of thermic centres in the brain.

As to the question of the direct effect of intra-cranial hemorrhages upon the general bodily temperature, my statistics (45 cases) show that in fatal cases, at least, there is on the first day after the stroke, a rise of rectal temperature, ranging from 100° to 102°, averaging in my cases nearly, if not quite, 101.7°. On the second day, if the cases are not immediately fatal, the temperature falls a little, and averages about 101° or 101½°. In acute softening, however (38 cases), there is rarely any disturbance of temperature, even in fatal cases, on the first day. On the

¹ Read at a meeting of the Association of American Physicians, May 31, 1894.

second there is often a slight rise, so that the average is $99\frac{1}{2}^{\circ}$ to 100° . Thus the presence of any temperature on the first and second days indicates a hemorrhage, and is, in addition, of serious import.

Neither hemorrhages nor softenings produce a high temperature themselves. The fever, if it exists, is only 101° to $102\frac{1}{2}^{\circ}$, or, perhaps, 103° . In those cases in which there is a terminal high rise of 105° , or even 107° , a pneumonia, and sometimes even a gangrenous pneumonia, is found. I note only one exception to this in my cases, and then the clot was in the thalamus.

This general law, that the temperature rises after a serious hemorrhagic laceration of the brain, and does not rise after a serious embolic or thrombotic softening of the brain, has only few exceptions, as when the embolic process is extremely large, involving, perhaps, an entire lobe, or when it is seated in the pons or medulla, or when it is due to a septic focus; but such cases are so rare that they do not invalidate the general clinical rule which I have laid down. While I have based it mainly upon temperature observations of my own, because these have been taken with special care and with special reference to this point, yet they tally also with the records of others, so far as my investigation goes.

The question of the *unilateral disturbances of temperature* after an apoplectic stroke is one that has interested me particularly, because it has seemed to furnish a more definite criterion of the nature of the injury. I have observed now seven cases of acute cerebral softening and three of cerebral hemorrhage in which the temperatures were taken in each axilla for some time after the stroke, and in some cases also in the rectum. Autopsies have been made also upon each of these cases. I have collected several other cases in which similar records have been made. I have also notes of a considerable number of cases in which the diagnosis of hemorrhage or softening could be made with approximate certainty. From the facts which I have thus obtained it has seemed to me that one can say with much certainty that in massive intra-cranial hemorrhages the temperature upon the paralyzed side is always somewhat higher than it is upon the sound side. In all my cases of cerebral hemorrhage there was on the first days, and continuously afterward, a greater rise of temperature on the paralyzed side, the average difference being one degree. On the other hand, in all my cases of acute softening, whether due to embolism or thrombus, there was practically no difference whatever between the temperature of the paralyzed and of the sound side. These conclusions seem to me to be in accordance with what we might naturally expect. The sudden tearing of the brain by the hemorrhage causes a certain amount of brain compression, and a greater functional disturbance than is caused by a simple obliteration of the artery's lumen. Surgical experience seems to confirm also the fact that brain lacerations are attended by rise of temperature.

Thus, Dr. Charles H. Phelps has called attention to the great uniformity of elevated temperature in injuries to the head, attended with contusion or laceration of the cortex. He thinks that there is sometimes an initial fall of temperature, followed by a progressive rise, and that this rise is a more constant symptom than unconsciousness. In 83 cases, of which in 45 there was an autopsy, this elevation of temperature was noted. He thinks it due to injury to the cortex, but does not place it in relation with any special portion of the cortex, or to any heat centre.¹

I append here the histories, much condensed, and the charts of the cases illustrating the temperature changes to which I have referred. I might add at this point one word with regard to the preliminary sudden fall of the temperature in cases of apoplexy. This preliminary fall is certainly a thing of rare occurrence. In my own experience I have seen it only once, and in looking over records of nearly two hundred cases of apoplexy due to hemorrhage or softening, the report of a preliminary temperature fall was not made. This, to be sure, may be explained on the ground that most of our hospital cases and many of our private cases are not seen until some hours after the shock occurs. I can only say, therefore, that practically it is a phenomenon rarely observed, and as I have seen it occur both in embolism and in hemorrhage, it has not a very great diagnostic value; still it undoubtedly does occur at times and it occurs more frequently with hemorrhage than with softening.

Cases of Cerebral Hemorrhage.

CASE I.—Julius Z., aged sixty years, admitted to hospital, January 17th; no previous history. Patient completely unconscious, breathing heavily; pupils even and moderately contracted. Total motor paralysis of right side, with well-marked anæsthesia of face and arm, less marked of trunk and leg. Heart and urine normal. Next day stupor not so extreme, occasionally speaks; anæsthesia less; paralysis the same. The next three days patient continued about the same. Death on the sixth day. Temperature as indicated in chart.

Autopsy. Lungs normal; heart normal. Extensive cerebral hemorrhage in left cerebrum between optic thalamus and left lenticular nucleus, involving the thalamus, extending into the left lateral ventricle and somewhat into the right. Small clot in fourth ventricle from passage of blood through aqueduct of Sylvius.

The records of Cases II. and III. were unfortunately mislaid after the temperatures had been charted. The following case is incomplete, but has some confirmatory value.

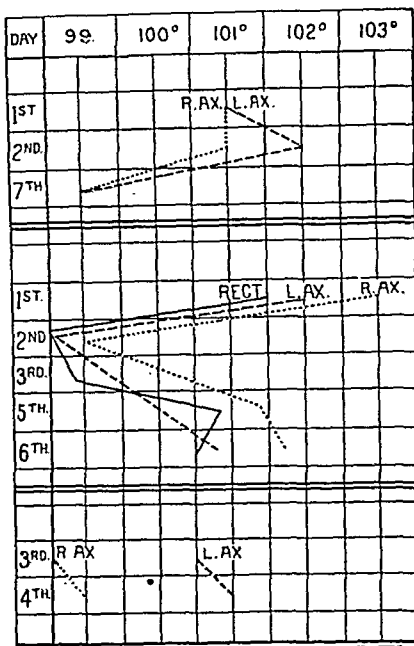
CASE IV.—Male, aged seventy years. Fell down suddenly with right hemiplegia, later became unconscious. Next day brought to Bellevue

¹ New York Medical Journal, January 14, 21, and 28, 1893.

Hospital (August 18th). Unconscious, hemiplegia of right side; pulse 72 and full. "Skin warm on right side, cold on left." Temperature $99\frac{1}{2}^{\circ}$.

CHART I.

CASE II.
(Left hemiplegia.)

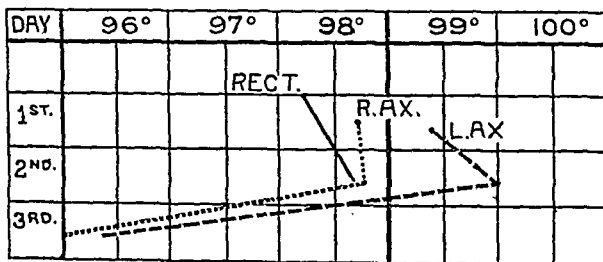


Died on second day. Autopsy showed hemorrhage involving the left corpus striatum and optic thalamus and breaking into ventricles. Beginning hepatization of lungs.

Cases of Acute Softening.

CASE V.—Leonardo L., aged forty-four years, brought to hospital June 4th; was partially conscious and spoke a few words; soon lapsed into semi-conscious condition from which he could be roused with difficulty. Total paralysis of left side, with diminished reflexes. Pupils equal, respond sluggishly; analgesia of left side, as shown by pricking with needles. Patient continued in semi-conscious condition, and died on third day. Temperature as indicated in Chart II.

CHART II.

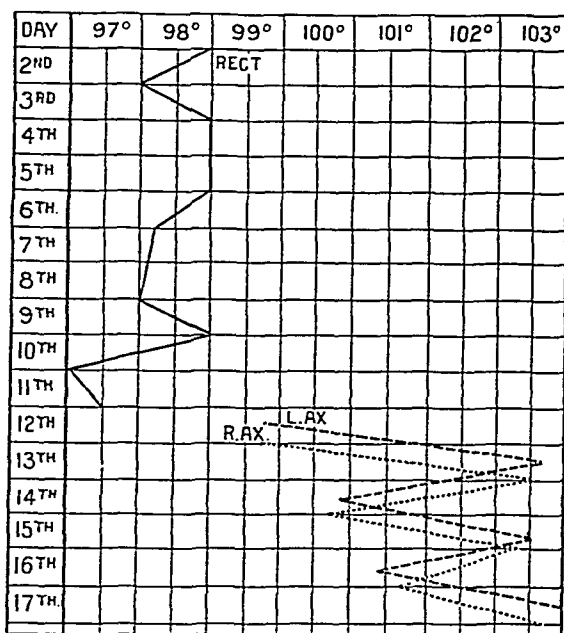


Autopsy. Brain showed a softening about the hippocampus major of right side; the area of softening extended into the central white matter

of the occipital lobe and forward into the temporo-sphenoidal lobe. The hippocampal convolution and gyrus fornicatus were not involved, but the area of softening was such as might include fibres from these parts. The basal ganglia were not involved; pons and medulla normal.

CASE VI.—Peter J., aged fifty-nine years; syphilis twenty-four years previously. Heavy drinker. Patient felt well up to previous night when he retired. Next morning, on arising, felt a numbness and weakness in left side. Was brought to the hospital next day. There is fine tremor and some ataxia in both arms; ataxia more marked on left side. Marked loss of power in left hand and leg, with exaggeration of deep reflexes. Urine normal. Intelligence fairly good at first, but patient gradually became semi-conscious and delirious, and died November 22d,

CHART III.

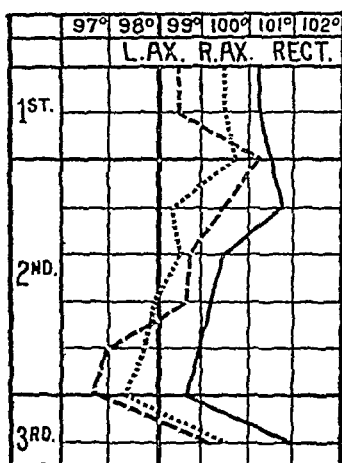


twenty-two days after admission. No temperature records were made between November 4th and 16th. The temperature in the rectum from the day after admission up to November 4th ranged from $99\frac{1}{2}^{\circ}$ to $97\frac{3}{4}^{\circ}$, there being no marked variations. On the second day it was $98\frac{1}{2}^{\circ}$, on the tenth day 98° . On the fourteenth day temperatures were taken in right and left axillæ, giving records such as are shown in Chart III.

CASE VII.—John B., aged seventy-three years, German, was admitted to the hospital March 9th in a condition of coma. No history. The patient can be partly roused to a consciousness of his surroundings. Face flushed; breathing quiet. Head and eyes turned to the right. Pupils moderately dilated and even. Marked rigidity of all the limbs, most pronounced in the left arm. The left hand and fingers are held rigid, the fingers being flexed. Heart-action weak. Slight amount of albumin in the urine. Twenty-four hours after admission the patient had slight spasms, beginning with convulsive movements of the face and left

hand. The patient was bled seven and one-half ounces from the arm, and seemed more conscious on the second day. The record shows that after this the coma gradually deepened, and the patient remained comatose, dying early the third day. The temperature record of the three days

CHART IV.



that he was in the hospital was taken in each axilla and in the rectum, and is indicated in Chart IV. Post-mortem showed in the brain two spots of softening, involving symmetrically each lenticular nucleus, and more particularly the globus pallidus.

This case I shall refer to again, because of its interest in connection with heat-centres. The temperature, as will be seen, did not rise in the axilla above 100.2°, and was most of the time normal. The rectal temperature showed a slight rise only. The temperature was taken very carefully eight times during the three days of the patient's presence in the hospital.

CASE VIII.—Thomas P., aged forty years, had suffered from locomotor ataxia for ten years; was still in the walking stage. Had a history of syphilis fifteen years before. Had a severe valvular heart lesion with hypertrophy. Sudden complete left hemiplegia, with inability to articulate or swallow except with great difficulty. The paralysis was almost total of arm and leg. The patient was semi-conscious and at times delirious. No anæsthesia. He improved slightly for four days, then grew worse, and died on the eighth day. His temperature was taken in the axillæ three or four times a day during this whole period. The temperature in the first twenty-four hours ranged in each axilla from 100° to 101°, being equal on the two sides. It fell a little below 100° on the second day, and continued at about 100° until the day before death, when it sank in each side to 98° or 99°; at one period it fell as low as 96.4°. The record is shown in the table.

The autopsy showed a large embolus blocking up the right middle cerebral artery, and causing an area of softening, involving the internal capsule and corpus striatum, some of the optic thalamus and centrum ovale. The heart showed serious valvular lesions as well as hypertrophy.

Temperature in Case VIII.

Time.	Right axilla.	Left axilla.	Time.	Right axilla.	Left axilla.
1.00 A.M. . . .	101	101 $\frac{2}{5}$	<i>February 1, 1890.</i>		
7.00 "	100	100 $\frac{3}{5}$	8.00 A.M. . . .	99	99 $\frac{4}{5}$
12.20 P.M. . . .	100 $\frac{1}{5}$	100 $\frac{3}{5}$	12.30 P.M. . . .	99 $\frac{2}{5}$	99
7.15 "	102	101 $\frac{3}{5}$	7.00 "	100 $\frac{3}{5}$	101
<i>January 29, 1890.</i>			<i>February 2.</i>		
7.30 A.M. . . .	99	99 $\frac{1}{5}$	8.30 A.M. . . .	97 $\frac{1}{5}$	98 $\frac{4}{5}$
2.45 P.M. . . .	99 $\frac{1}{5}$	100 $\frac{2}{5}$	1.45 P.M. . . .	98	99
7.15 "	100 $\frac{1}{5}$	100 $\frac{4}{5}$	7 00 "	100	100
<i>January 30.</i>			<i>February 3.</i>		
7.00 A.M. . . .	99	98 $\frac{3}{5}$	12.30 A.M. . . .	98	99
12.00 M. . . .	99 $\frac{4}{5}$	99 $\frac{3}{5}$	8.00 "	96 $\frac{2}{5}$	96 $\frac{4}{5}$
7.00 P.M. . . .	101 $\frac{2}{5}$	101	12 00 M. . . .	96 $\frac{1}{5}$	98
<i>January 31.</i>					
7.00 A.M. . . .	100 $\frac{2}{5}$	100 $\frac{1}{5}$			
12.15 A.M. . . .	101	101			
8.00 "	100	100 $\frac{4}{5}$			

CASE IX.—Ann G. Sudden right hemiplegia with motor aphasia, dysphagia, right hemianæsthesia very marked in the face. Intelligence dull. Early rigidity of paralyzed side; progressive weakness; death in two months.

This patient, whose history I have detailed in my article on "The Cortical Localization of Cutaneous Sensations," showed a continuous difference of temperature of the two sides, amounting for a time to a degree or more, and in particular an initial fall of temperature on the non-paralyzed side during the first two days. There was, however, at no time any marked rise of temperature on either side, the range being 98.5° to 99.5°.

The *autopsy* showed atheromatous arteries and a large patch of yellow softening, involving the second and third left frontal and part of the lower half of the precentral convolution of the left side.

CASE X.—A woman, aged sixty years; left hemiplegia; death on the fifth day. Temperature on the fifth day in each axilla 98.5°. The *autopsy* showed thrombosis of the right middle cerebral.

The clinical and pathological evidence which I have collected and presented here does not, as a matter of fact, represent all the evidence which I possess to sustain the view that hemorrhages cause in the first place a greater immediate rise of temperature, and in the second place a greater unilateral difference in temperature than softenings do. One must bring to bear upon the judgment of such questions personal experience in cases where the positive pathological data are not obtainable, as well as the experiences of other observers; and it is with a full consideration of these facts in mind that I have reached the conclusions which I have stated.

We come now to the third question, that is, as to the effect of the *special localization of clots or softened spots upon temperature changes*,

and this question brings up at once the whole subject of thermic centres.

The experimental investigations made for the purpose of discovering heat-centres have been numerous, and it is not my purpose to go into this subject extensively. The work of Ott,¹ Wood,² and Reichert³ in this country, of Hale White⁴ in England, of Aronsohn and Sachs,⁵ Landois, Eulenburg, Girard,⁶ Baginsky and Lehmann,⁷ and Baculo⁸ on the Continent, has produced results which are somewhat conflicting.

Some experimenters have found that injuries of the caudate nuclei and corpora striata produce a rise of temperature. Ott finds a rise of temperature resulting from a puncture just in front of the caudate nuclei, but lays especial stress upon the tuber cinereum as a heat-centre. Reichert finds (1) that the automatic thermogenic centres are located in the spinal cord; (2) that the cruciate and Sylvian centres are thermo-inhibitory; (3) that the caudate nuclei and medulla oblongata contain thermo-accelerator centres; (4) that no specific heat-centres probably exist in the optic thalami; (5) that specific thermotaxic heat-centres, *i. e.*, centres having a common control over both heat production and heat dissipation do not exist.

Nearly all observers find that lesions of the corpus striatum are followed by marked increase of temperature, generally due to increased heat production. Baculo believes that the thalami are heat-centres, but both Reichert and White seem to doubt this. In some experiments of Wood and White lesions of the crura cerebri were followed by febrile rise, but Reichert does not confirm this view. Nearly all experimenters agree that lesions of the pons cause a rise in temperature. White thinks that lesions of certain points of the cerebral cortex may cause a rise of temperature and also lesions of the crura cerebri and of the septum lucidum.

About all that one can conclude from the physiological experiments thus briefly referred to is that injuries of the corpus striatum and of the pons cause a rise of temperature. As to whether injuries of the tuber cinereum or optic thalamus or cortex have a similar effect the evidence is still conflicting. It seems to be pretty well agreed that injuries of the white matter of the cerebrum and of the central and occipital lobes of the cerebellum do not cause temperature elevations.

The question arises now whether these somewhat conflicting physio-

¹ Therapeutic Gazette, September, 1887; Journal of Nervous Diseases, April, 1894.

² Smithsonian Contributions: Fever.

³ University Medical Magazine, March, 1893, and 1894, p. 303.

⁴ Journal of Physiology, 1891, vol. xii. p. 233.

⁵ Pflüger's Archiv f. Physiol., lvi. p. 237.

⁶ Archiv de Physiol., 1886, viii. p. 28.

⁷ Virchow's Archiv, 1886, cvi. p. 258.

⁸ Journal of Nervous and Mental Diseases, March, 1891.

logical data can be applied to clinical medicine. Dr. Hale White has endeavored to fulfil the task of making this application, and in the various articles which he has written¹ has reported cases of his own and of others which lead him to think that there are thermic centres in the brain. He reports cases in which lesions of the corpus striatum were followed by rise of temperature; also cases of lesion of the cortex and of the pons with similar phenomena. His cases, however, do not, in my opinion, stand close critical analysis. In Case II., for example, which is cited as an illustration of lesion of the corpus striatum with fever, the hemorrhage extended into the right and third ventricle. In Case VIII. his patient, a boy of six and a half years, had right hemiplegia for three months before any fever came on; then he had convulsions. Autopsy showed a double lesion of the corpora striata. In another case² a man had paraplegia for a year before fever came on. Autopsy showed a bilateral softening of both internal capsules, involving slightly both the striata and the thalami. He quotes a case of Ollivier in which there was a hemorrhage into the optic thalamus and crura cerebri with a temperature of 102° , and another case of hemorrhage into both optic thalami with a temperature of 105.7° ; ³ also a case of Wernicke's of hemorrhage into the basal ganglia with a temperature of 105° ; ⁴ and one of Bourneville's of hemorrhage into the optic thalamus, ventricle, and corpus striatum with temperatures of 103.4° and 107.6° .⁵ Another case supposed to be in point is one reported by Bagojawlewski, of echinococcus of the corpus striatum with rise of temperature.⁶ All these cases, however sympathetically considered, seem to me to carry but slight weight, for, in the first place, very few of them are strictly localized lesions; in the next place, as I have already shown, sudden lacerating lesions, like that of hemorrhage, will, if of any extent, cause rise of temperature, no matter where located, as a rule; and, finally, there are cases of localized lesions of these supposed thermic centres in which no hemorrhage has been found. I have myself reported above a case of bilateral lesion of the striatum without any fever, and I have the records of a similar case with similar absence of temperature rise. I have no doubt that a diligent search of records would lead to the accumulation of a great deal more negative evidence. With regard to lesions of the pons, however, there is more uniform agreement. Undoubtedly a lesion of the pons, unless very small, will cause immediately a rise of temperature. As for lesions of the cortex, it is the opinion of Dr. Phelps that contusions of this region, wherever they occur, are

¹ Guy's Hospital Reports, vol. xxvii., 1884; Lancet, July, 1890; International Clinics, 1893, p. 163.

² Lancet, June 29, 1891.

³ Gazette Hebdomadaire, 1875, No. 12.

⁴ Lehrbuch der Gehirnkrankheiten, ii. 48.

⁵ Etude clin. et thermomét. sur les Maladies du Système Nerveux.

⁶ Centralblatt f. d. med. Wissenschaften, 1888.

almost uniformly associated with rise of temperature; and he is inclined to believe that this rise is dependent, not upon the point of location of the lesion, but upon its character. Surgeons who operate upon children are familiar with the sudden shooting up of the temperature for twenty-four hours after a linear craniectomy, and this rise is, perhaps, due to some temporary injury of the cortex.

My own cases bearing on thermic localization are—some of them—of much interest. Thus in Case VI., Peter J., above referred to, the temperature ranged never above 99° until the twenty-first day; then it gradually rose to 100° and 104° , as shown in chart. The autopsy record reads: "On the outer edge of the right lenticular nucleus there was a patch of softening about the size of a bean. There were also many capillary extravasations in the lenticular nucleus and in the adjoining internal capsule." The lungs were practically normal. Left brain normal. This case might be used by the localists, but the lesion was present for three weeks before the fever.

In Case VII., above cited, there was a double softening of the lenticular nucleus, and here the temperature rose on one day to 101.8° in the rectum, but its general average was but slightly above normal.

I have another case of localized clot in the lenticular nucleus. The patient had hemiplegia, but gradually improved. A few weeks later she developed pneumonia and died. Temperature records are given as soon as the pneumonia appeared, and I can only infer that, according to custom, it was taken at first, found normal, and then not recorded.

Cases of complete blocking of the middle cerebral with hemiplegia due to softening, involving the corpus striatum, without fever, are, I believe, not uncommon. Case X. illustrates one of this class.

My cases illustrating lesions of the thalamus and neighboring parts are also of interest.

CASE XI. is that of a man, aged sixty-four years, who was admitted with left hemiplegia and hemianæsthesia and dulled intelligence. He became somewhat delirious and died on the seventeenth day, eight weeks after his attack. During the last four days of his illness the temperature ranged from 97.6° to 98° .

Autopsy showed an old hemorrhage occupying the site of the right optic thalamus. On the outer side of the old hemorrhage is a more recent one. Here is a *clot in the optic thalamus with subnormal temperature.*

CASE XII. is that of a man admitted to the alcoholic cells with delirium tremens and a temperature of 105° . He died on the third day with a temperature of 105.8° . Autopsy showed a clot the size of a bean in the middle of the right optic thalamus; brain intensely congested; lungs normal. Here, however, the febrile disturbance might have been due to alcoholism.

CASE XIII. may have some interest in connection with Dr. Ott's theory that the tuber cinereum is a thermic centre. The patient was a

woman of fifty years, who came into the hospital in a semi-delirious state. She had small rigid pupils and slight right hemianæsthesia. She continued nearly comatose for eight days, and died of œdema of the lungs. Temperature on admission, 102° . It ranged between 100° and 102° until she died. Autopsy showed "softening of the inter-peduncular space;" third ventricle, the optic thalami on each side were slightly softened. The corpora quadrigemina were slightly affected.

I have records of a case of softening of the frontal lobes with normal temperature, and one of hemorrhage into one frontal lobe with a temperature of 102° . But my paper has already exceeded its limits.

Taking all the facts into consideration, it seems to me that we cannot yet assert that there are any definite heat-centres in the human brain, and can only say that temperature rises are more apt to be caused in man by lesions of the pons than elsewhere, and next to this by lesions of a hemorrhagic and lacerating kind, involving the cortex cerebri. It is a fact of some importance, and one to be borne in mind in estimating the value of experiments on animals, that the regions which cause temperature rise are also those which are most vascular, and lacerations of such parts must necessarily have a greater traumatic importance. Then again, the transference of the results of animal experiments to man involves a good many elements of error. The corpus striatum of the rabbit, for example, is a very important part in that animal's brain; but in man this ganglion is a latent region and is probably a rudimentary organ, a vestigium, whose original work has been transferred to the brain cortex. Man gets along very well with badly injured striata, but the rabbit does not, and heat-centres in this latter animal would not have necessarily the same locus in man.

So far as my own positive results are concerned, I have but few data. In two cases where the optic thalamus was especially involved in hemorrhage there was a very high temperature, but in almost all my cases the high rises of temperature were associated with extensive lacerating lesions or else with some superimposed inflammatory process in the lungs. This latter fact must always be borne in mind in reporting cases of apoplexy with subsequent fever. Very often a sharp rise of temperature in three or four days after a stroke indicates only a beginning pneumonia, and in two of my cases I have found the pneumonic process to be fetid in character and accompanied naturally with a very high fever.

Allow me now, gentlemen, in conclusion, to review the results which I have endeavored to reach. They are:

1. That all intra-cranial hemorrhages, whatever their lesion, are much more apt to be accompanied with immediate disturbances of temperature than are necrotic processes from embolism and thrombosis. These temperature disturbances in hemorrhages are, in rare cases, a sudden initial

fall; then in almost all cases except where the lesion is small, there is within a day or two a rise of temperature of from one to three degrees. On the other hand, in acute softening this initial fall and early rise do not occur unless the process is very extensive or involves the pons.

2. In apoplexy due to hemorrhage, the temperature is greater upon the paralyzed side than on the normal, the difference averaging about one degree. In acute softening this unilateral difference of temperature does not occur or is extremely slight.

3. The rise of temperature due to apoplectic lesions depends more upon the extent and nature of the lesion than upon its location. Lesions of a hemorrhagic character in the cortex, however, are especially apt to cause a rise of temperature. Lesions in the pons also either of hemorrhagic or softening character, almost uniformly cause a rise of temperature.

4. There is as yet no clinical evidence that lesions of the basal ganglia or the parts about them cause temperature rises on account of destruction of certain thermic centres; in other words, the clinical and pathological evidence of thermic centres in the human brain, aside from the parts mentioned, is yet inadequate.

5. Finally, gentlemen, I would specially impress upon you the great value, from a diagnostic point of view, of a careful study of the temperature changes after apoplectic strokes. The temperature should be observed on each side of the body, in the rectum, also, if possible. With data thus obtained one can, I feel sure, gain much more positive evidence as to the nature of the lesion in these cases, and I have repeatedly been able to satisfy myself, in my clinical work, of the nature of the lesion by means of the methods referred to. I do not believe that with the help of the numerous factors which we now have in aiding our diagnosis there are many cases of apoplexy in which it is difficult to make a diagnosis. The old-time tabulation of differential points in diagnosis between hemorrhage and acute softening still remains of value. We need, and must use, all the helps possible; but if we, in addition to other methods, carefully apply the thermometric, I am sure we can reach vastly more satisfactory results.

PREVIOUS PAPERS ON APOPLEXY BY THE AUTHOR.

"Forms of Cerebral Hemorrhage." *Medical Record*, August, 1890.

"Diagnosis of Intra-cranial Hemorrhage and Acute Softening." *Medical Record*, July 25, 1891.

"Vertigo in Temporal Lobe Lesions." *Journal of Nervous and Mental Diseases*, July, 1889.

"Hemorrhage in Cerebral Abscess."

"Primary Hemorrhage in Lateral Ventricle." *Journal of Nervous and Mental Diseases*, 1892, p. 47.

"The Apoplectic Pulse." *The Post-Graduate*, 1893, p. 276.

THE BACTERIOLOGY OF PYELONEPHRITIS.¹

BY GEORGE M. STERNBERG, M.D.,

SURGEON-GENERAL U. S. A.

IN considering the etiology of nephritis a broad distinction must be made between those forms known under the general name of Bright's disease and pyelonephritis, or the so-called surgical kidney. In the first-mentioned forms, which may be denominated hæmatogenous, the primary cause of the renal inflammation is, as a rule, and perhaps always, some toxic substance in the blood which acts as an irritant to some portion of the renal parenchyma. And when micro-organisms are found in the urine in cases of this kind or in sections of the kidney removed post-mortem, their presence is probably to be regarded either as accidental or as secondary to the changes in the kidney, rather than a cause of these changes. It is not at all unusual to find colonies of micrococci or of bacilli in the necrotic foci found in certain forms of nephritis, but the inference that the inflammatory process and resulting necrosis were due to these bacteria is not justified either by the microscopic appearances of the sections or by experimental investigations. On the other hand, in ascending nephritis or pyelonephritis, which is very commonly secondary to a cystitis of long standing, there is good reason to believe that the inflammatory changes and pus formation depend principally upon the presence of certain bacteria which are found in the urine of such patients during life and in the diseased kidney removed by surgical operation or post-mortem. And recent researches show that the bacillus coli communis, which is constantly present in the intestine of healthy individuals, is found more frequently than any other micro-organism in the so-called "surgical kidney." This bacillus is now known to be the usual cause of peritonitis. It has been obtained, in pure culture, from a number of cases (8) of abscess of the liver,² from urinary abscesses (6),³ and from the pleural cavity in certain cases of pleurisy (9).⁴

The most important and comprehensive work upon the bacteriology of pyelonephritis is that of Schmidt and Aschoff,⁵ published in Jena in 1893. The authors named give a complete *résumé* of the literature of the subject, and a full report of fourteen cases of pyelonephritis, in which they have made bacteriological investigations. They also report

¹ Read before the Congress of American Physicians and Surgeons, Washington, May 31, 1894.² Bignami, Stern, Netter and Martha, Rodet and Roux, Létienne, Veillon and Jayle, Vivaldi, Levy.³ Krozius, Clado, Albarran and Hallé, Tuffier and Albarran.⁴ Albarran and Hallé, Sevestre, Renard, Lesage and Macaigne, Levy.⁵ Die Pyelonephritis in anatomischer und bacteriologischer Beziehung, und die ursächliche Bedeutung des Bacterium coli commune für die Erkrankung des Harnwege.

a series of experiments upon rabbits, in which injections of a pure culture of the bacillus coli communis were made into the left ureter, after tying it below the point of injection. The ligature was removed after the injection had been made and the wound in the abdominal wall, which had been made with antiseptic precautions, was closed. Some of the animals so treated died in from twelve hours to four or five days, while others survived and were killed on the seventh and ninth day.

The left kidney, especially in the cases which survived the operation for several days, was found to be two or three times as large as the right and to present all the evidences of parenchymatous inflammation. The pelvis of the kidney contained more or less ammoniacal urine, pus, and bacilli; the parenchyma gave evidence of diffuse inflammation and contained numerous bacilli. As a rule a pure culture of the bacillus coli communis was obtained from the inflamed kidney.

A similar experiment was made with a species of proteus (vulgaris?), and with a similar result. The animal died at the end of two days. The left kidney was twice as large as the right, the surface of a deep-red color dotted with numerous white spots; the parenchyma had a striped appearance on section and a greenish color in the vicinity of the pelvis, which contained ammoniacal and bloody urine. A putrefactive odor was given off from the organ. Proteus in pure culture was recovered from the interior of the kidney.

Another rabbit received in the same way an injection into the ureter of a bouillon culture of staphylococcus pyogenes aureus. The animal died at the end of forty-eight hours. A fibrinous inflammation was found at the point of injection and the left kidney was about twice as large as the right. The capsule was easily detached and the surface was of a deep-red color dotted with small white foci of infection, which also existed throughout the organ. The pelvis contained thick reddish-colored pus. Staphylococcus aureus was recovered in cultures from the kidney and from blood taken from the heart.

Schmidt and Aschoff say that the changes found in the kidneys of rabbits after the injection of bacillus coli communis into the ligated ureter correspond with those seen in the "surgical kidney" of man. They were surprised at the rapidity with which the bacilli penetrated the urinary tubules. The first changes in the parenchyma of the organ occurred at the end of thirty-six hours, and at the end of five to seven days these changes had reached their extreme development. They evidently depended upon the invasion of the urinary tubules by bacilli. This conclusion corresponds with that reached in previous researches by Albarran,¹ Achard and Renault,² and by Krogius.³ According to

¹ Thèse de Paris, 1889.

² Sur les rapports du b. coli comm. avec les b. des infections urinaires. Soc. de Biol., 1891, p. 830.

³ Recherches bactériologiques sur l'infection urinaires. Helsingfors, 1892.

Schmidt and Aschoff, some of the earlier observers have described non-liquefying bacteria obtained from the bladder in cases of chronic cystitis or of pyelonephritis following cystitis, which correspond in morphological and biological characters with *bacillus coli communis*, and were no doubt identical with it. They believe that the bacillus described by Clado¹ (1887) under the name of "*Bactérie septique*," and subsequently found by Albarran and Hallé² in forty-seven out of fifty cases of cystitis (fifteen times in pure culture), and called by them "*Bacille pyogène*," is in fact the *bacillus coli communis*.

The elaborate researches of Rovsing³ upon the bacteriology of chronic cystitis were published in 1890. Thirty cases were studied, with the following results: In one case diagnosticated as cystitis no bacteria were found; in three cases culture experiments gave a negative result, but the tubercle bacillus was found in the urine by microscopical examination—in these cases the urine was strongly acid; in twenty-six cases the urine was ammoniacal, and in all of these bacteria were found—usually but a single species. All of these grew in the usual culture media except the tubercle bacillus, which in two cases was associated with some other species, and all produced alkaline fermentation in sterile urine when added to it in pure cultures. The following species were found: Tubercle bacillus, *staphylococcus pyogenes aureus*, *staphylococcus pyogenes albus*, *staphylococcus pyogenes citreus*, *streptococcus pyogenes ureæ* (n. sp.), *diplococcus pyogenes ureæ* (n. sp.), *cocobacillus pyogenes ureæ* (n. sp.), *micrococcus pyogenes ureæ flavus* (n. sp.), *diplococcus ureæ trifolius* (n. sp.), *streptococcus ureæ rugosus* (n. sp.), *diplococcus ureæ* (n. sp.), *cocobacteria ureæ* (n. sp.).

Pure cultures of all of these species introduced into the bladder of rabbits failed to induce cystitis, even when injected in considerable quantities. But when retention of urine was effected artificially for six to twelve hours, allowing time for ammoniacal fermentation to occur, cystitis was developed. When the pyogenic species were introduced under these circumstances, a suppurative inflammation of the mucous membrane occurred; the non-pyogenic species caused a catarrhal cystitis. Rovsing records the important fact, as bearing upon the etiology of cystitis, that in twenty of the cases examined the bladder had been invaded by the finger or by instruments prior to the development of cystitis.

Lundstrom (1890) isolated from alkaline urine obtained from patients with cystitis two species of staphylococci—*staphylococcus ureæ candidus* and *staphylococcus ureæ liquefaciens*; from albuminous, acid urine he

¹ Deux nouveaux bacilles isolés dans les urines pathologiques. Soc. Anat., May, 1887, p. 339.

² Note sur une bactérie pyogène et sur son rôle dans l'infection urinaire. Bull. de l'Acad. de Méd., T. xx., 3e S., Paris, 1888, p. 310.

³ Die Blasenentzündungen, etc. Berlin, 1890.

obtained streptococcus pyogenes.¹ Krogius obtained from the urine of individuals suffering from cystitis a bacillus which he calls urobacillus liquefaciens septicus. Schnitzler² (1890) found the same bacillus, or one very similar to it, in thirteen out of twenty cases of purulent cystitis examined by him. In eight of these cases it was obtained from the urine in pure cultures, and in five it was associated with other bacteria. In twelve of these twenty cases the cystitis resulted directly from catheterization; in the others it occurred in individuals suffering from stricture or from calculus.

When cultures of this bacillus were injected into a vein in rabbits, the animals died in from three to eight days, and in every instance an intense nephritis was observed at the autopsy—twice with the formation of small abscesses. The bacillus was found in the blood and the organs generally. Injections into the bladder of rabbits almost always gave rise to a severe purulent cystitis—large rabbits were selected, and great care taken not to injure the mucous membrane of the bladder. Schnitzler was not able to induce cystitis in rabbits by injecting in the same way considerable quantities of a culture of staphylococcus pyogenes aureus.

According to Schmidt and Aschoff subsequent researches indicate that some of the species described by Rovsing as being new are in fact varieties of bacillus coli communis.

The identification of the bacillus pyogenes of Albarran and Hallé (Bactérie septique of Clado) with bacillus coli communis was first made by Krogius³ (1891), and about the same time by Achard and Renault.⁴

In twelve cases of cystitis, six of which were complicated with ascending nephritis, Krogius demonstrated the presence of bacillus coli communis, and showed that in its growth in culture media it corresponded with the bacillus pyogenes of previous authors. In a second communication Krogius⁵ states that in twenty-two cases of cystitis studied by him he obtained bacillus coli communis sixteen times, and of these fourteen times in pure culture. He also calls attention to the fact that in those cases where no other micro-organism was associated with the colon bacillus the urine was always acid—a statement which is sustained by the subsequent researches of Schmidt and Aschoff. He also gives details with reference to the pleomorphism of this bacillus and differences in the appearance of gelatin cultures from different sources, the growth being sometimes opaque and sometimes transparent. When cultures of

¹ Sur un bacille pathogène trouvé dans les urines pathologiques. La Semaine Méd., 1890, No. 31.

² Zur Aetiologie der akuten Cystitis. Centralbl. für Bakteriöl., Bd. viii., 1890, p. 789.

³ Note sur le rôle du b. coli commune dans l'infection urinaire. Archiv de Méd. expér., t. iv., 1892, p. 66.

⁴ Sur les rapports du b. coli commune avec le b. pyogènes des infections urinaires. Soc. de Biol., Dec. 12, 1891, p. 830.

⁵ Recherches bactériologiques sur l'infection urinaire. Helsingfors, 1892.

this bacillus were injected into the bladder of rabbits and retained by ligating the urethra, an intense cystitis was developed in from twenty to thirty hours. Injections into the ureter gave a result similar to that subsequently reported by Schmidt and Aschoff. The animal died in about two days, and pyelitis, together with more or less necrosis of the renal epithelium, was found at the autopsy. Reblaub¹ (1892) obtained bacillus coli communis in pure culture in six out of sixteen cases of cystitis examined.

In their latest publication Achard and Renault² arrive at the conclusion that there are some differences between their "urobacillus" and bacillus coli communis, which they state as follows:

1. Upon most media, especially upon malt-agar, the growth is more luxuriant.

2. Cultures of the urobacillus upon potato appear grayish-white, very luxuriant, and have many gas-bubbles.

3. The urobacillus develops much gas even in gelatine and agar cultures containing little sugar.

Morelle³ (1872) and Denys⁴ (1892) in their bacteriological researches obtained from numerous cases of cystitis a bacillus which they identified with bacillus lactis aërogenes of Escherich. But the last-mentioned author has since stated that this bacillus presents varieties which cannot be distinguished from the typical cultures of bacillus coli communis.

The recent researches referred to having shown that bacillus coli communis is very commonly present in the urine in cases of cystitis, and often in pure cultures, its etiological relation to the disease in question seems probable, and this view is further sustained by experiments upon animals and by the demonstrated fact that retention of urine *per se* does not give rise to inflammation of the bladder. But this is not the only micro-organism which is capable of causing a cystitis when introduced into a bladder which has suffered some kind of mechanical injury or has been subjected to the action of chemical irritants contained in the urine. The researches of Krogius, Schnitzler, and of Schmidt and Aschoff show that next to the colon bacillus the micro-organisms most commonly found in cases of cystitis and of pyelonephritis is a proteus (*P. vulgaris*?).

At the date of the publication of the monograph of Schmidt and Aschoff the bacillus coli communis had been found in pure culture in sixty cases of cystitis, and the proteus in thirteen cases. The authors named say:

"But two species of bacteria (bacillus coli communis and proteus) have, up to the present time, been demonstrated to be the cause of pyelo-

¹ Des cystitis non-tuberculeuses chez la femme. Paris, 1892.

² Sur les bacilles de l'infection urinaire. Compt. rend. de la Soc. de Biol., April 9, 1892, p. 311.

³ Étude bactériologique sur les cystitis. Liège, 1892.

⁴ Étude sur les infections urinaires. Bull. de l'Acad. Royale de Méd., Louvain, 1892.

nephritis. When, in addition to these, other bacteria or cocci are found, we have a pyæmic mixed infection."

An important point to be kept in view is the fact that when bacillus coli communis is found in the urine in pure culture, this fluid is more or less acid, as the bacillus in question does not give rise to alkaline fermentation, at least not under the conditions found in the bladder and in the absence of retention. But when proteus is present the urine is almost always ammoniacal.

The number of cases of pyelonephritis reported since 1889 by the authors heretofore referred to (Albarran, Rodet, Morelle, Krogius, Achard and Renault, Schnitzler) in which bacillus coli communis was found and was probably the exciting cause of the ascending nephritis, is twenty-nine, and in twenty of these the bacillus referred to was found in pure culture.

Finally, I think we are justified in concluding that cystitis and ascending pyelonephritis are usually caused by micro-organisms introduced through the urethra into a bladder which is rendered susceptible to infection by mechanical violence or chemical irritation. And that the most frequent cause of such local infection is the bacillus coli communis, which is constantly present in the intestine and upon the external surface in the vicinity of the anus, from whence it may easily be transported to the interior of the bladder by catheters, etc., used by the patients themselves or by their medical attendants. According to Bouchard¹ it has been shown that this bacillus is sometimes found under the prepuce and about the vulva of healthy persons, and this is what we should expect from their proximity to surfaces which are constantly soiled with discharges containing it. But there is no evidence that the bladder is reached by the direct invasion of this or other bacteria without mechanical assistance. The researches of Lustgarten and of Mannaberg², and of Krogius³ show that bacillus coli communis is not found in the normal urethra.

THE ABUSE OF TRACHELORRHAPHY.⁴

BY WILLIAM R. PRYOR, M.D.,

VISITING SURGEON, CITY HOSPITAL, GYNECOLOGICAL DIVISION; VISITING GYNECOLOGIST, ST. ELIZABETH HOSPITAL; ADJUNCT-PROFESSOR OF GYNECOLOGY, NEW YORK POLYCLINIC.

THE question of the immediate closure of torn cervixes I will not discuss in this paper, but will deal only with the operation as applied to conditions which have existed for some time.

¹ Charrin: Sur la bactérie commune des infections urinaires. Soc. de Biol., 1891, p. 851.

² Ueber die Mikro-organismen der normalen männlichen Urethra. Vierteljahrsschr. f. Dermatol. u. Syph., 1887, No. 4.

³ Arch. de Méd. expér., 1892, p. 75.

⁴ Read before the American Gynecological Society, Washington, D. C., May 29, 1894.

Trachelorrhaphy is performed for the cure of erosions, cervical hypertrophy, cystic degeneration, sterility, subinvolution, to prevent cancer, and for "reflex symptoms." These are some of the reasons given for doing the operation; there are doubtless others.

Categorically and in detail I will discuss the various lesions for which the operation is done. "Erosions" are found in most cases of purulent endometritis of the nulliparous; are very generally found when purulent endometritis is associated with conditions which enlarge the uterus, as polypi; are often noticed with laceration of the cervix, but are not found with this condition unless there be a purulent endometritis or endocervicitis. The only circumstance under which this cervical folliculitis (erosion) is very generally present, whether associated with the long cervix of the maid or the torn one of the mother, is when there is a purulent discharge pouring over it from above the os internum. We meet with the most liberal tears with great ectropion of the lips, entirely free from folliculitis. But the cervix will not tolerate a flow of pus over it for even a few days without presenting the condition known as erosion. And, filthy as the vagina usually is, if this supply of pyogenic cocci from above be cut off, the simplest treatment suffices to subdue the erosion without trachelorrhaphy.

The cervical hypertrophy so often found associated with bad tears, is caused in two ways: more often it existed largely before labor, and is increased, of course, by pregnancy. But it is frequently the result of long-standing interstitial folliculitis. The most pronounced hypertrophy, without tears, we find in old virgins, an hypertrophy which may be termed strictly "interstitial." The large cervix, I am inclined to believe, more often leads to pronounced laceration and persists in enlargement after the tear, and less frequently will a normal cervix hypertrophy merely because torn. If the incisions of Simpson and Sims accomplished nothing else, they proved that incision of a certain form of hypertrophied cervix is followed by marked atrophy.

Those of us who employ cervical incisions for protracted first stage due to hypertrophy of the cervix never notice that increased growth of the cervix follows the operation, although the incisions are not sewed up after delivery.

It is inconceivable by me why a tissue composed of unstriped muscle, connective tissue, and compound racemose glands, should take on new growth merely because certain of its fibres have been separated in labor, when the very opposite follows the clean incision of the same structure.

The fact that an hypertrophied cervix becomes lacerated in labor, surely does not indicate a necessity for performing trachelorrhaphy. And although the cervical tissue is thrown into an extraordinary activity by pregnancy, and is torn by labor, the indication for operation does not point to trachelorrhaphy as the procedure to be adopted. Whether we

assume that the enlargement of the cervix is due to a new growth, or that it is merely a laceration of a previous hypertrophy, it would appear to be undesirable to again unite these diseased tissues.

Sterility is said to follow laceration of the cervix. It is hardly worth while disproving this statement. Still, it may be well to point out that every woman has her cervix torn at her first labor; and nothing in professional experience is more common than that a woman for some years sterile, bears a child, is lacerated and brings forth regularly thereafter. An interesting form of scientific mind seems to be possessed by those who sew up the cervix for acquired sterility; inasmuch as commonly, the same gentlemen cut open the cervix for sterility in young women. The speculum view of the subject is entirely too limited.

In one case a cervix is too stenosed, and therefore the woman is sterile; in the other it is too open, and again she is sterile—a case of which Mr. Tyndall might term the *unscientific* use of the imagination. The truth of the matter is that the cervix is merely a sphincter muscle, and is purely mechanical in its functions, and so long as its integrity is such that it can properly act as a sphincter and support to the uterine muscle, it is not necessary to unite its separated fibres. I grant that the widely gaping hypertrophied lips we often see are pathological; but they were not natural before the labor. The tear takes place in the cervix already abnormal, and, as a rule, the greater the ante-partum hypertrophy, the greater the necessity for a tear. The standard of a normal uterus is not to be found in the woman of thirty, but in one of fifteen; and hypertrophy of the cervix in the latter, whether after or before she has a child, is not to be expected. The standard must be adopted from that state of the organ when it is in the first perfect establishment of its functions, and not after it has been in disuse for years and has begun to undergo changes.

For no condition is trachelorrhaphy more often performed than for subinvolution. If it is done while the uterus is undergoing its normal involution, if done during the puerperium, hyper-involution is not an infrequent result.

Retarded involution appears to me as the result of causes other than a torn cervix, more especially the character of the labor preceding it. Certainly, in my experience, it is more common to find it occurring after first labors, other conditions being similar, than in women who are multiparous and who have torn cervixes. In fact, I have observed cases where it was not present at all until after a trachelorrhaphy had been performed. I must ask the Fellows to remember that at each uterine contraction in labor the corpus is deprived of blood circulation. This occurring many times through an obstructed labor, and probably followed by the loss of much blood, is the cause predisposing to subinvolution. It is this delayed, protracted, first stage, this fatigue of the

uterine muscle, together with a poor general condition, which bring on subinvolution.

We do not find that subinvolution follows Dührssen's incision; and the more open the cervix (lacerated by previous labors) the easier the labor, and easy labors do not conduce to subinvolution. If rupture of the cervix with a profuse hemorrhage and consequent anæmia occurs, subinvolution is prone to result. But it is the difficult labor, the loss of blood, which causes it, and not the separation of cervical fibres.

Cystic degeneration, as it is called, or interstitial folliculitis, more frequently follows as a result of generous cervical tears, for the follicles enlarged by pregnancy more readily inflame after the tissues are torn. The possibility of the occurrence of this condition is a slight argument in favor of immediate closure of a torn cervix; but its presence in a lacerated cervix is a positive contra-indication to trachelorrhaphy. Cervices the seat of this degenerative condition require a more radical procedure than sewing the lips together. In view of the careful observations made in the very beginning of epithelial infiltration of the cervical tissues, and because of the very chronic, subtle way in which the follicular change takes place in the deeper structures, cystic degeneration assumes a position far more important than one of simple glandular hypertrophy. The most profound questions involved in the histogenesis of epithelioma are suggested by these cases. They demand a very thorough removal of all of the affected tissue, and not puncturing of cysts and trachelorrhaphy.

There are certain women in whom the knowledge of any departure from the normal standard about their genitalia will bring on some form of hysterical manifestation. Almost any operation will benefit them. It is merely a question of suggestion generally.

Briefly and without argument I will state my disbelief in the reflex effects of lacerated cervix, except to a very limited degree. In some women any form of peripheral irritation will establish a more or less severe degree of neuritis; and occasionally a cystic cervix will have such an effect. The removal of the affected tissue is here demanded, and not its union by suture.

I believe that cancer of the uterus is becoming more and more frequent. As the disease is more thoroughly studied, and as the great majority of cases are primarily of the cervix, the belief is becoming pretty general that laceration of the cervix gives rise to it. The fact that negroes rarely have it, although their cervices are very raggedly torn; that bats do not have it; that erect-walking monkeys do not have it, although *their* cervices get torn, has no bearing on the question. These are not subject to cancer anywhere.

That we find cancer of the cervix in women with torn cervices, and not with those with intact cervices, although in both the cervix is at the

junction of the transition of one form of epithelium to another, I will try to explain.

The very life-history of the uterus is one of sudden onsets of developmental activity and equally sharp retrograde processes. The unimpregnated uterus is in an embryonic state. Cancer with the parous woman is more common, because in her only does this embryonic cervix, on the border of transitional epithelium, spring from the embryonic condition to that of complete functional activity and mature growth. It occurs less frequently with the maid, merely because her corporal uterus, and never her cervix, imitates at the menses what takes place with the parous woman. Thus it is, that when the nulliparous woman has cancer it is in that part of the organ which has mimicked the parturient uterus, and not in the quiescent cervix. It is not during the periods of greatest activity that we find cancer most often developing, but it is when the final retrograde metamorphosis is beginning. I believe that the phenomena of development and involution incident to pregnancy are much more prominent in the causation of cervical cancer than are the tears which invariably follow labor. The great part which functional activity with periods of repose plays in causing cancer is well shown in the preponderance of mammary cancers in women who have nursed. Or will the advocates of local irritation as a cause of cancer say that the cracked nipples which nursing women have cause their cancers?

In the years of greatest activity among New York surgeons in performing trachelorrhaphy I have collated statistics:

	Per cent. female deaths from all cancers.	Per cent. female deaths from cancer of organs other than uterus.	Per cent. deaths from cancer of uterus.
1881	2.57 per cent.	1.61 per cent.	0.96 per cent.
1887	3.09 "	1.94 "	1.15 "
1893 ¹	3.00 "	1.90 " (estimated)	1.10 " (estimated) ¹

Surely in 1893 the good effects of literally the thousands of preventive trachelorrhaphies which in the preceding twelve years had been performed should be shown; but, on the contrary, cancer of the uterus is increasing. It is not from our case-books that we should compute the results upon cancer of this operation, but from the statistics prepared by so careful a registrar as Dr. Nagle.

¹ The total per cent. female deaths from cancer in 1893 being three, and the ratio of deaths from cancer of the uterus and from cancer of organs other than of the uterus being known for other years, the two classes were in this way estimated. It may be that there is a possible error here, but the great apparent fact is that in twelve years cancer in women has increased almost 0.5 per cent.

In the period mentioned, Dr. Emmet's teaching was generally adopted in New York, and every one, even general practitioners, sewed up torn cervixes. I do not think we may justly ascribe cervical cancer to a torn cervix. The disease is one of the curses of our civilization and of our white race. Not by seeking for its local causes can we expect to check it, but by a critical study of every condition under which the disease occurs may we hope to arrest its inheritable tendencies.

Women who have by heredity a tendency to cancer should remain sterile, inasmuch as repeated childbirths more than anything else conduce to it and disseminate it. If we operate to *prevent* the possible occurrence of cancer in those who may reasonably expect it, assuredly trachelorrhaphy is not indicated, but a more radical procedure which will remove the entire cervix.

A pathological laceration of the cervix, requiring trachelorrhaphy, I would define as any laceration which is of such severity and degree as to implicate the circular fibres of the cervix sufficiently to cause a modification in shape or position of the uterus. A tear to do this must sever most of the sphincter fibres of the cervix at one or more points. The lesions found associated with the laceration of the cervix I deem best treated by either a curettage of the uterus or by some form of amputation of the cervix which provides for the maintenance of a cervical mucous membrane. And usually it is well to combine the two operations in conditions demanding the latter.

Trachelorrhaphy I would limit to the immediate operation for hemorrhage, and to those cases of tear through the cervix from internal os out to the vaginal junction, cases of true extra-peritoneal rupture of the uterus.

Common to all mammalia is the uterus. In all its function is the same. In shape, in size, it varies greatly in the several species of animals. As the conditions of life under which the various individuals live differ, and as there is a wide range in physical conformation, so in sympathy with these influences do we find variations in the shape of the uterus. Certain general propositions may be stated as bearing upon our subject. Quadrupeds and other mammalia which habitually maintain a horizontal position have a very soft uterine muscle, rich in lymph streams, and no cervix worthy of the name. The uterus rests upon the pelvis or anterior abdominal walls, and does not require much density of tissue to preserve its shape and position. In those animals which have a true cervix, lacerations of that structure have been noticed. In certain of the quadrumana, the cervix is not only torn in labor, but erosions are found and papillary excrescences. These animals have a stout uterine wall, like the human. Woman has a cervix and a thick uterine muscle, because the position of the uterus and its shape (pregnant and empty) must be maintained by the integrity and strength of its walls. Provision

is also made against the premature escape of the foetus by furnishing her with a cervix. So it is with those animals which habitually assume the erect posture, even our common bat. And because of the excess of connective tissue, these uteri are comparatively sparsely supplied with lymphatics. Therefore the blood of the menses and rut is discharged externally, in labor the cervix is torn, the placenta is expelled, and there is a post-partum lochial discharge.

In other mammalia the rule is that there is no tearing of the os tincae, the blood of rut, the placenta, and the decidual tissues are absorbed. We have seen that more or less tear takes place at all first labors in women. Already the fact must be suggested to you that surely a certain degree of laceration of the cervix is physiological. Were the cervix capable of simply stretching to allow the escape of child and placenta, in but a few hours would its elastic fibres contract and retention of the lochia ensue with toxicosis. I can but believe that Nature has intended this lesion as a safeguard. In seeking general laws applicable to woman we must not consider physical woman in her present condition of refinement and mental elevation. Not for such surroundings and condition has she been given a certain physical conformation. But as a primitive creature, living in unclean surroundings, bringing forth in early youth, dependent solely upon her own physiological forces for protection against destruction of her procreative organs, has Nature made her uterus.

Laceration of the cervix is a lesion common to woman and to many animals. It is not the result of misguided Nature, but it is one of her beneficent acts to protect the life of the individual and to insure propagation of the species. When our modern woman so far advances that she will cease to discharge her placenta, that she will cease to have a lochial discharge, she may have all tears in her cervix united. Until that time arrives, she has need for a lacerated cervix; it is essential to her safety.

Further, if she will bear her first child while she is yet in the formative stage, at sixteen or seventeen, what laceration of the cervix takes place at that first labor will be sufficient for all subsequent labors, and will not be pathological, inasmuch as it will occur before the uterine muscle has atrophied and before the cervix has markedly increased in size.

But inasmuch as the cultured woman delays childbearing until she is near the middle of her menstrual life, living and dressing unnaturally, she conceives with a degenerate uterine muscle, with a rigid, and often hypertrophied cervix. In such a woman labor must be tedious and difficult. She is very prone to suffer a pathological laceration of the cervix, or to have established some one of the conditions I have described. Her life and her labor have been unnatural. It is not necessary that the false reasoning so pervade our science that we err in performing an operation for a lesion which is due to her unnatural life, perhaps, but

which is often the means of saving her from infection. Remove from the life and puerperium of even our high-bred women the elements of septic and specific infection, and even with their distorted uteri, the conditions I have spoken of, as well as more serious ills, will not so often be found associated with the inevitable cervical tear. But when found, pray let us have the proper conception of their causes and significance, and apply to each its indicated procedure.

Emmet's teachings have been so misapplied that now a condition which is natural to the mother is considered pathological, and is subjected to operation. When the cervix uteri is so far advanced in disease as to require an operation, I do not believe trachelorrhaphy the preferable procedure. When the laceration is of such degree that a cosmetically perfect cervix can be secured by trachelorrhaphy, I do not consider any operation necessary. Erosion after labor requires the same treatment as in the virgin.

Hypertrophy in the parous woman needs the operation applicable to hypertrophy in the nulliparous. And those other conditions of the cervix which follow labor, whether associated with a slight or a severe laceration, necessitate the removal of more tissue than trachelorrhaphy secures. The great objections I have to trachelorrhaphy are, that it does not give a cervical canal of dimensions equal to the requirements of a woman, who should, as she gets older, bear each successive child with greater ease and security than the preceding; it does not remove sufficient tissue where operation is indicated; and it does not appeal to me as a rational procedure, believing, as I do, that most of the cases subjected to it, require no operation whatever on the cervix, inasmuch as a generous laceration is normal and necessary.

The marvel is that, seeing all mothers have torn cervixes, we have not before sought the reason. The indications for performing the operation constitute the measure of its limitations, and from them may be deduced its abuse.

HYSTERECTOMY IN BILATERAL DISEASE OF THE APPENDAGES.¹

By FLORIAN KRUG, M.D.,
OF NEW YORK.

THE Hegar-Batthey operation of years ago gave us results which, in view of our utter ignorance of all that related to disease of the appendages, seemed startling and most gratifying. But this operation, though legitimately applied by surgeons, yet, because of its first furor, created in the minds of the less skilled an entire misinterpretation of its limita-

¹ Read before the American Gynecological Society, Washington, May 29, 1894.

tion, and was subjected to the grossest possible abuse. To such an extent was this carried that the operation was brought into entire disrepute. From this extreme point of abuse we have come back to a just estimate of the value of the operation, and are able fully to measure all that it accomplishes and all in which it fails. And, whereas the original operation is rarely performed upon the indications first laid down for it, yet, at least, it has pointed out to us the way for a proper adaptation of practically the same procedure under more precise and more limited indications. Until we had this operation the teachings of Bernutz were lost; but fully appreciating the operation, and, still more, the failures of its first application, the more accurate pathology of Bernutz showed us the true scope of the Hegar-Bathey operation. Thus it is, while discarding this operation absolutely, we must yet accord it the credit due, as a step in the proper treatment of the diseases under consideration. And although this new application of the Hegar-Bathey operation to the treatment of purulent diseases of the adnexa seemed to us to be about all that we could expect, yet in the light of the surgery of to-day, and a more precise analysis of the results of this further differentiation of the original operation, we are brought to the decision of considering it wholly unsatisfactory. Primarily, it seemed to be health- as well as life-giving, but although the patients were cured of the grosser and more acute lesions and symptoms, yet, to-day, we find that the ultimate results have not consummated our hopeful expectations. And although we are not content with these ultimate results, yet must we consider them glorious compared with the treatment of neglect, based upon the cellulitis theory of the cause of these lesions. Life has been saved, to be sure, but not so often has health been restored as we expected, and as might be desired. The cause of this failure to symptomatically cure these patients lies in an extension of the inflammatory conditions beyond the grosser lesions made manifest by our coeliotomy. Did the removal of these gross but secondary lesions cut short the symptoms, or did we not by their removal leave the essential and primary cause of all the trouble, together with the less apparent, but more fruitful source of suffering, the inflamed uterus, and its nerve centres? I unhesitatingly answer, Yes.

We are now in a position to justly, as well as accurately, estimate the benefits derived from the old operation of removal of bilateral purulent disease of the appendages; and we are also able to say in how far that operation has failed. Careful observation, devoted to cases through some time, demonstrates that while pathologically they are cured, but few are symptomatically relieved. The cause of the failure to accomplish all that might be desired, so far as the subject of the operation is concerned, lies in our failure to remove the original and persisting source of infection. The question has simply resolved itself

into this: that either the cases operated on by those who claim that the uterus, when left, is not a cause of further symptoms and may be rendered innocuous by mild treatment, are not thus cured, or else gentlemen making these statements have submitted to their skill the most simple cases, as a rule, and in the severe ones have failed to observe the results of their work. The cause of continuance of distressing symptoms is the primary lesion in the diseased uterus; the effect of the premature and artificial menopause upon the sympathetics; the irregular and delayed involution of the uterus; the adhesions formed between the intestines and raw surfaces in the pelvis; the possibility of repeated reinfections of the uterus; the possibility of ventral hernia, owing to the different methods of drainage; and many other lesser lesions, together with malpositions natural to the uterus repeatedly inflamed and deprived of its natural supports. Broadly stated, a continuance of the symptoms is due to a retention of the inflamed uterus, which is the primary seat and original cause of every lesion found in these cases, and the effects of its continued influence upon the pelvis, lymphatics, and nerves.

Observations of the results of my own operations and those obtained by the old method, made me eager to grasp any possibility of obtaining better, more speedy, and more permanent relief for these women from the one great subjective symptom, *pain*.

In 1890, having removed many cancerous uteri *per vaginam* with absolutely uncomplicated recoveries, a case presented with bilateral suppurative disease of the adnexa and a large retroflexed uterus. Curettage, salpingo-oöphorectomy, and hysterorrhaphy were contemplated; but the excellent results obtained from removal of the uterus and adnexa in cancerous cases suggested to me that, inasmuch as the woman had to be castrated, why should I not remove the diseased uterus also. This I did. The remote, as well as the immediate result, was perfect. The severe criticism following the report of this case, and the timidity incident to my conscious fallibility, forced me to resume the old routine and generally practised operation. But this one case had left upon my mind an impression and a brilliant picture. During this period of my relapse from the proper procedure in these simple suppurative cases, I removed many fibroids having purulent adnexa. The contrast was unavoidable between the results obtained by ablation of the fibroid uterus with bilateral suppurative tubal disease, and those which followed removal of these tubes and retention of the inflamed uterus. In both classes the uteri were diseased; and the belief came to me that the difference in immediate as well as remote results was due, *must be due*, to the retained uterus in the latter class.

In September, 1892, I again removed a uterus, associated with bilateral suppurative tubo-ovarian disease, selecting the abdominal route rather than the vaginal, for reasons to be presently stated. At this time I was

yet undecided as to a routine practice in these cases; and while adopting the old method in some, and the more radical in others, I was enabled to compare the result in the two classes. And this contrast was made more marked by the fact that cases presented themselves to me on whom I had previously removed bilateral suppurating adnexa, with a persistence of most distressing symptoms, and who were entirely relieved of all symptoms when I, by a secondary operation, removed the uterus.

Such a study substantiated me in the belief, and confirmed me in the method I now employ, of, in every case demanding the sacrifice of both adnexa, removing the uterus also. The following reasons appeal to me why the uterus should be removed in these cases:

The uterus without the adnexa is a useless organ, and devoid of physiological function.

It is not innocuous; it is, on the contrary, positively a diseased and therefore harmful organ.

Histologically, the tubes are but parts of the uterus, and their removal is partial amputation of the uterus; therefore, why should we not go a step further and remove the rest of the diseased organ?

Is it conceivable—clinically, is it a fact—that those projections of uterine tissue which we call the tubes are *alone* diseased, and not the rest of the uterus?

This question is pertinent and forceful when it is known that the primary seat of the disease is the uterine cavity, and that the tubes are involved by direct continuity of tissue. Although in the last few years the indications for drainage have, under a more perfect technique, become limited to a very small class of cases, still there are those which demand drainage in a *surgical* sense. What route for this drainage more proper than the one Nature has provided for the lochia and other physiological discharges?

Leaving the uterus merely invites future infection; and it may be, I think, fairly stated that a woman who has contracted gonorrhoea from husband or lover will again be subjected to the same exposure after her tubes are removed. And although we may, for argument, grant all that those who practise the old operation claim for it, yet, surely, these will assent that removal of the uterus relieves the woman from the possibility of further contamination of this organ. Careful observation and questioning of my patients has elicited the fact that the artificial menopause is much easier for the woman who has had her uterus removed, whether for cancer, for fibroid, or when associated with disease of the adnexa, than when the tubes alone are removed. The explanation of this lies in the fact that when we remove the uterus we remove the great mass of ganglionic tissue in the organ.

Did this operation involve an increased danger to the woman some objection might be made to it; but it does not. On the contrary, it

lessens the mortality in the hands of those familiar with the technique of hysterectomy. In its performance it takes no longer than the admittedly proper procedure of curettage preceding a cœliotomy, and some less time than to attach a proper drain where drainage is demanded, or to do a hysterorrhaphy. And when we consider the possible necessity for a secondary cœliotomy to remove a uterus for persistence of symptoms, or to close a hernia following drainage, the argument for the complete piece of work in the first instance becomes still more powerful. My objection to the vaginal route in hysterectomy is, that when once begun it must be completed, and the operation does not admit of a clearer estimate of the disease of one or the other adnexa, and possibly some conservative procedure.

Were I addressing a society of those not skilled in abdominal surgery I might not dare to advocate for their adoption this complete operation, but would advise some palliative procedure. But my apparent boldness is born, not of a disregard for what the operation embodies, but belief in a just and proper estimate of the incompleteness of the old method and the completeness of this. That I may not be misunderstood, in closing I will emphasize the fact that I am dealing only and solely with those lesions of the adnexa which unquestionably demand the removal of the adnexa where both are the seat of disease precluding the possibility of cure by all conservative methods.

AMPUTATION OF THE ENTIRE UPPER EXTREMITY (INCLUDING THE SCAPULA AND CLAVICLE) AND OF THE ARM AT THE SHOULDER-JOINT.¹

WITH ESPECIAL REFERENCE TO METHODS OF CONTROLLING HEMORRHAGE. WITH A REPORT OF ONE CASE OF THE FORMER AMPUTATION AND FOUR OF THE LATTER.

BY W. W. KEEN, M.D.,

PROFESSOR OF THE PRINCIPLES OF SURGERY AND OF CLINICAL SURGERY IN THE
JEFFERSON MEDICAL COLLEGE.

In this paper I shall consider, first, amputations which allow of simple disarticulation at the shoulder-joint itself; secondly, those cases in which the axilla is invaded, yet to such an extent as to allow of its being thoroughly cleaned out, followed by amputation at the shoulder; and, thirdly, those cases in which the parts are so far invaded as to necessitate the removal of the entire upper limb anatomically, that is to say, including the removal of clavicle and scapula.

¹ Read before the American Surgical Association, Washington, May 29, 1894.

I. SIMPLE AMPUTATION AT THE SHOULDER-JOINT, THE AXILLA NOT BEING INVADDED. All surgeons who have performed this operation know that the control of hemorrhage is the key to the situation. I have not had the leisure to make a statistical research into the percentage of recoveries since the introduction of antiseptics, but in a modern amputation at the shoulder-joint the surgeon has a right to expect recovery in the vast majority of cases, provided that the hæmostasis and the asepsis are perfect. The want of accord among surgeons as to the best method of preventing hemorrhage during the operation, and the improvements which have of late been introduced, warrant a reconsideration of the question.

The methods for the prevention of hemorrhage fall into two categories: 1, methods applicable to the subclavian vessels; and, 2, methods applicable to the axillary vessels.

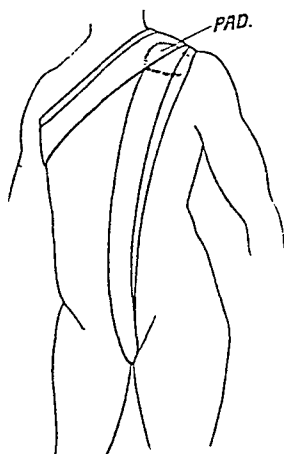
1. *Subclavian methods.* a. In most text-books the method advocated is that of compressing the subclavian by the thumb or by a well-wrapped key. "I am of opinion," says Jacobson,¹ "that the more the surgeon trusts to this plan solely, the more often will he have cause to regret it. Pressure, however well applied at first with the thumb, aided by a padded key or a weight, is too often rendered uncertain by the necessary changes in position of the limb during the operation, or in the pressure of assistants, a violent gush of blood at the last showing the surgeon that his confidence in the artery being secured is misplaced. Furthermore, an assistant so used is necessarily much in the way of others aiding the surgeon." The opinion thus expressed is precisely my own—formed not as a theoretical conclusion, but after experience and observation, both as an operator and as an assistant who has endeavored, too often unsuccessfully, satisfactorily to compress the artery. In a recent case of Dr. Hearn's, Dr. Allis suggested and practised a modification of this method, which I think of value. The two chief reasons for the want of success of the method are: first, that the assistant gets tired and makes inefficient compression; and, secondly, that his fingers or the key slip from the proper place. Dr. Allis effectually controlled the artery by wrapping the end of a stick about eighteen inches long with some sterilized gauze, and then holding the pad so made in position with his two hands, while compression was made by the weight of his body against the end of the stick, thus overcoming the objection of fatigue, and the retaining of the stick by the fingers was very effective. This method, however, in view of what I shall say later, should, in my opinion, be used only exceptionally.

b. In the *Annals of Surgery*, July, 1890, and again in a later communication (*N. Y. Medical Journal*, July 4, 1891, p. 27), I published another method of compressing the subclavian. (Fig. 1.) In this I proposed that a wooden or a pure rubber pad should be placed over

¹ Operative Surgery, p. 117.

the artery and kept in position by an Esmarch bandage, beginning at the pad and passing down the back and under the perineum, then over the pad and around the sound axilla, alternating the two turns, thus both making compression on the artery and holding the pad firmly

FIG. 1.



Keen's method of compressing the subclavian by a pad and Esmarch's bandages.

in place. I have tried this method in the following instance, but found it unsatisfactory and abandoned it in favor of compression of the subclavian, as the patient was a child.

CASE I. Amputation at the shoulder-joint for extensive burn of the arm; recovery.—Mary C., of Morrisville, Pa., aged nine years, was sent to the Jefferson College Hospital, on February 20, 1892, by Dr. Groom, of Bristol, Pa. On the 4th of July, 1891, while playing near a fire, her dress caught fire and she was badly burned. The left arm and forearm, excepting a little patch on the inside of the upper arm, were burned from shoulder to wrist. On her left thigh was another large burn and another on the abdomen. After prolonged treatment by Dr. Groom the abdominal wound healed, but the entire arm from shoulder to wrist was one large ulcer, excepting just above the inner condyle; and on the left thigh was another ulcer eight by four inches. For the arm nothing but amputation at the shoulder-joint would answer, not only on account of the size of the ulcer, but because the tissues had been burned entirely to the bone and there was no possibility of recovery of motion.

Operation, March 30, 1892. I attempted first to control the hemorrhage by a supra-clavicular pad of pure rubber gum and an Esmarch bandage, but not being able readily to adjust it, I abandoned its use, and Prof. Brinton compressed the subclavian over the first rib. The granulation tissue resulting from the burn stretched to within two inches of the acromion on the outside and within two and a half inches of the axilla on the inside. On the outside, therefore, I was compelled to utilize one and a half inches of this granulation tissue for the deltoid flap. I used an ordinary bistoury, first cutting a deltoid flap from with-

out inward, and then an axillary flap. The vessels were then tied, and the flaps united with a drainage-tube. During the entire operation the child lost not over four ounces of blood. She reacted well and had no vomiting.

On the day after the operation her temperature rose to 103.6° , and two days later to 104° . By the fourth day, however, it had fallen to the normal and remained practically so afterward. Primary union took place between the flaps, but the deltoid flap and a very small portion of the axillary flap still consisted of granulation tissue on the external surface. On the night of April 27th, her temperature having been perfectly normal, a fire in the neighborhood of the hospital caused great excitement in the wards and sent her temperature up to 105.4° . It fell, however, to 99° by the next day.

On May 12th her brother and herself were both etherized, and I transferred some skin-grafts by Thiersch's method from her brother's thigh to her own, and also to her shoulder. These at first did well, and for three weeks it looked as though the ulcer would be entirely cured, but then the grafts melted away almost entirely. She was discharged on June 14, 1892, with the ulcers in a good condition.

April 3, 1893. The child returned for inspection, and I found that the ulcer on the shoulder-joint was entirely healed, and that on the thigh was reduced to a small ulcer, two by one and a half inches, and was still slowly healing. The skin-grafting seemed to stimulate the wound toward an earlier healing than would otherwise have resulted.

May 1, 1894. She writes me she is in excellent health, the ulcers being healed.

That the method has, however, a place in certain cases in which manipulation *in the axilla itself* is necessary, as in wounds of the axillary vessels, is shown by a case which I quoted¹ in which the late Dr. Charles T. Parkes used it with great advantage. In fact, the operation he did could hardly have been done by any other method. Still, upon the whole, I regard the method as inferior to Wyeth's (*vide infra*).

c. Prior ligation of the subclavian artery. This, of course, is effectual. It has, however, in my mind three objections: First, it adds a second serious operation, and so prolongs the time required for the amputation at the shoulder; secondly, the ligation of the vein is practically impossible without resection of the clavicle; thirdly, if the vein is not ligated there is always the serious danger of the entrance of air during the operation—a danger more than once realized.

2. *Axillary methods.* These may be divided into two categories: A. Methods in use prior to the introduction of Esmarch's tubing, and B. Different methods of using Esmarch's rubber tubing.

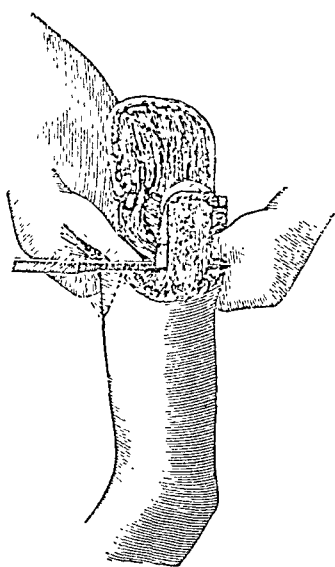
A. Methods prior to Esmarch's elastic tubing.

a. Compression of the inferior or internal flap by the fingers, which seize the vessels before they are cut. It is too familiar to all sur-

¹ New York Medical Journal, July 4, 1891, p. 27.

geons to need a description. Figs. 2 and 3 illustrate it. This is one of the best and most reliable methods, but has the objection that it

FIG. 2.



Digital compression of the vessels before cutting the internal or vascular flap. (JACOBSON.)

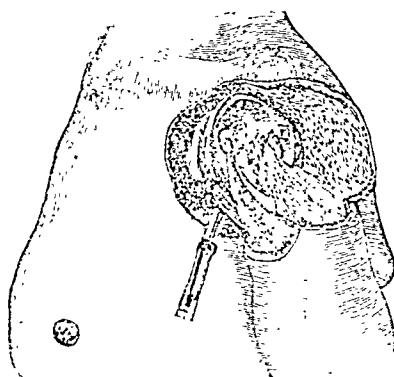
FIG 3.



Digital compression of the main vessels in the vascular flap after disarticulation. (JACOBSON.)

does not arrest the hemorrhage from all the bloodvessels, but only the main ones, and also that it requires an assistant, who is more or less in the way. It requires a very reliable, cool-headed assistant. Next to Wyeth's pins, however, I think this the best method.

FIG. 4.



Seizure of the axillary vessels by hæmostatic forceps before disarticulation. (JACOBSON.)

b. As an illustration of what simple means may be used in emergencies, the method of Harvey¹ may be quoted. Having no reliable assistants,

¹ Indian Med. Gaz., July 1, 1874, p. 190.

he simply covered the end of an office ruler with some lint, and had an untrained assistant compress the artery by pushing the ruler well up in the axilla, and made a satisfactory amputation.

c. Ligation, or seizure of the axillary vessels with hæmostatic forceps before they are cut. (Fig. 4.) This is also a method which does excellent service and is especially to be commended when one has insufficient or inefficient assistance, or in emergencies, as illustrated by the following case:

CASE II. *Amputation at the shoulder-joint for a mass of ulcerating tubercular axillary and subclavicular glands involving the axillary vessels and nerves; death from exhaustion.*—Miss J. P., aged nineteen years, was kindly sent to me by Dr. W. H. C. Smith, of Millville, N. J., and entered the Jefferson Hospital on November 14, 1891. Both of her grandfathers, two uncles, and one brother died of consumption, and another uncle is very ill with the same disease. About two years and a half ago she noticed a small lump just below the right clavicle, which gradually increased in size. About four weeks ago it broke in the axilla, giving vent to a watery discharge. She has never had very much pain in the tumor, except from tight clothing. Shortly after the tumor appeared her feet began to itch, and from the feet the itching gradually spread over the entire body, so that she is now covered with scratch-marks. When the tumor first appeared she weighed 121 pounds, but her weight gradually fell to 99. She has been gaining of late, and now weighs 108 pounds.

Status præsens. A rather delicate girl, with a mass of glands in the right armpit and under the clavicle, nearly the size of a fist. In the axilla is a large, gaping, deep ulcer, with a very foul smelling discharge. Diagnosis: Tuberculosis of the axillary and subclavian glands. I advised that an attempt should be made to remove the glands, as it was clear that there was no tendency to heal, but, on the contrary, that she was steadily getting worse.

Operation, November 18, 1891. An elliptical incision was made over the axillary mass, including all of the diseased tissue. I dissected upward toward the apex of the axilla and toward the vessels and nerves, in order to determine the relation of the tumor to these structures. I found that the vessels and nerves were so completely imbedded in the tumor that it was evidently impossible to remove the mass without sacrificing all these important structures. Accordingly, I determined at once to do an amputation at the shoulder-joint. I first tied the vessels in the axilla, as they were already exposed, and then amputated by Dupuytren's method.

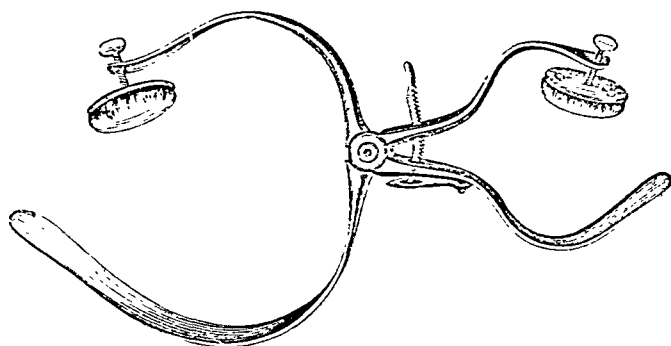
She made a very good operative recovery, but in the second week the tissues began to break down, with renewed tubercular ulceration. Cough set in, and she rapidly wasted and died on December 7, 1891, nineteen days after the operation, from exhaustion. No post-mortem was obtained.

d. I should mention, perhaps, Gross' compressor. (Fig. 5.) Practically, however, this is never used.

e. Furneaux Jordan's method, by making a circular amputation at the surgical neck of the humerus, securing the vessels as in a hip-joint amputation, the bloodvessels having been compressed by an Esmarch

band or other similar method, followed by disarticulation of the upper end of the humerus. The method is not without its advantages, especially in growths or injuries comparatively low down, yet requiring a

FIG. 5.



Gross' compressor.

shoulder-joint amputation, but it is needlessly long and does not seem to me to possess the advantages of the method of my choice, as indicated below.

FIG. 6.

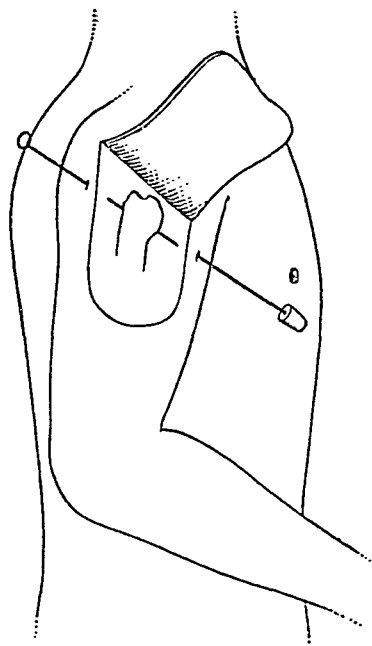
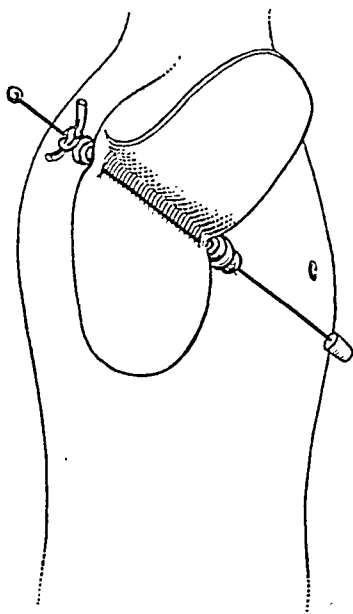


FIG. 7.



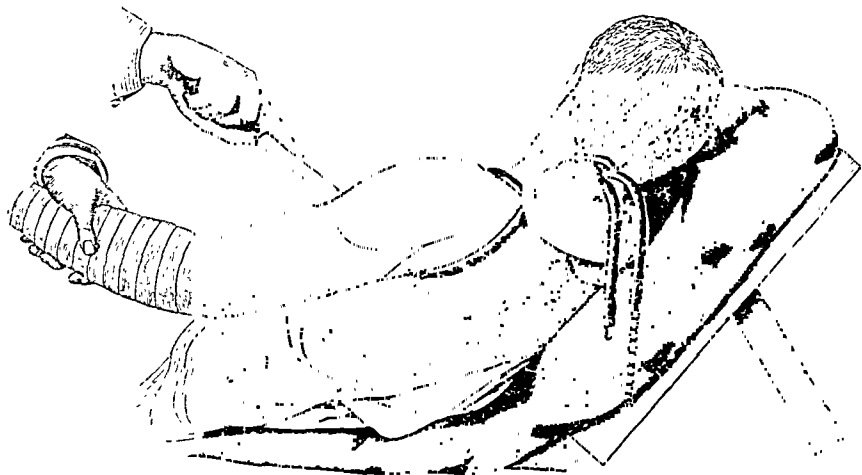
Allis' method by one pin through the vascular flap and an elastic tubing around the pin.

B. The four following methods are all based on elastic compression of the vessels by means of rubber tubing, and are varieties of the method of hæmostasis introduced by Esmarch.

a. Allis' method. (Figs. 6 and 7.) After making the antero-external flap, a stout pin is passed through the postero-internal flap, between the vessels and the bone, and elastic tubing wound over the ends of the pin, either in oval or figure-of-eight. Dr. Allis' frank statement in his report of a case¹ in which he employed this method shows the difficulty which arose. The vessels retracted above the constricting band and produced a serious and embarrassing effusion of blood into the tissues, requiring ligation of the subclavian artery. The danger of aspiration of air into the vein after the tubing is removed and before the axillary vein is secured, should not be forgotten. This method, so far as I know, was first employed by Dr. Allis in 1890.

b. Esmarch's method.² (Fig. 8.) In this method an elastic tube is placed in the axilla and drawn tightly over the shoulder, where it is grasped by the hand of an assistant. It is open in my mind to serious objections; first,

FIG. 8.



Esmarch's method by rubber tubing around the axilla and shoulder.

that the assistant is in the way; second, that he is almost certain to get tired and relax the compression, especially toward the end of the operation, at the very time when the disarticulation is made and the vessels cut; and third, and chiefly, that when the disarticulation is effected, the tubing, not now being held in place by the humerus or by any pin, may easily slip and grasp the flaps, thus obstructing access to the vessels, and in the inevitable confusion of an emergency like this, a large amount of blood may be lost.

c. Moore's method. (Fig. 9.) In 1873 Esmarch³ published his method of controlling hemorrhage by an elastic bandage and tubing. So far as

¹ Trans. Amer. Surg. Assoc., 1894.

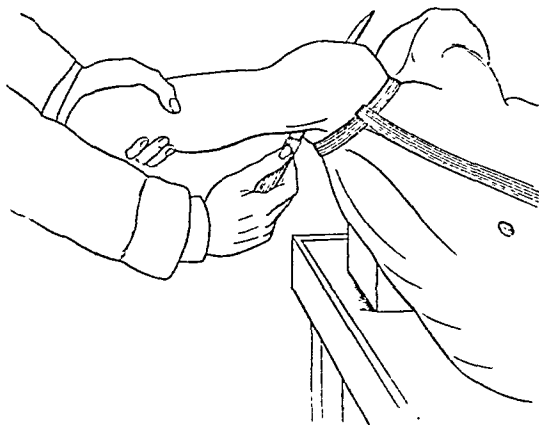
³ Berlin. klin. Wochenschr., No. 32.

² Kieg's Chir. Technik, vol. ii., p. 193.

I know, Moore¹ was the first to utilize it in amputation at the shoulder-joint. His brief report of his method is appended:

"In cases of amputation at the shoulder-joint that have come under my observation I have noticed the chief difficulty of the operation to consist in controlling the hemorrhage attending it, necessitating the aid of a quick and competent assistant. I have twice, in performing this

FIG. 9.



Moore's method by rubber tubing held in place by an anterior bandage.

operation, adopted a method which renders it almost a bloodless one. I lay a piece of calico bandage across the chest and upper part of the shoulder, and then fix an India-rubber cord or tourniquet around the shoulder over the bandage; this effectually compresses the axillary artery. In order to prevent the India-rubber cord from slipping, an assistant takes both ends of the bandage and holds them across the chest.

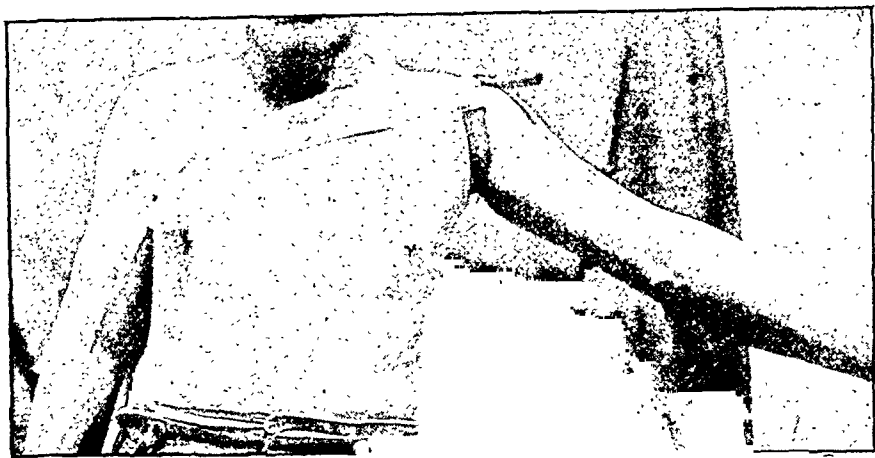
"If called upon to repeat the operation, I would pass a calico bandage under the India-rubber cord, *behind* as well as in front of the shoulder, then tie the four ends together, and thus dispense with the aid of an assistant."

Fig. 10 shows the latter method of preventing the slipping of the tubing by two bandages tied around the body, as suggested but not figured by Moore. In obtaining the photograph, as the tubing was applied on the living body it was wound rather loosely for obvious reasons. It has the advantage of getting rid of an extra assistant, and doubtless holds the tubing well in place. It obviates the piercing of the soft parts by the pins, but the punctures caused by the pins are of no importance practically. The cut of this method showing the tubing held in place by the anterior bandage alone, in Ashhurst's *Surgery*, is credited to

¹ Lancet, 1879, ii. 796.

Stephen Smith, but belongs, I think, to Moore. Smith's own cut is not attributed to anyone.

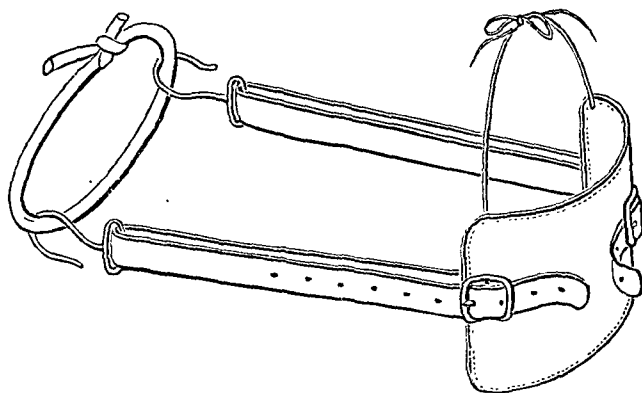
FIG. 10.



Moore's method by rubber tubing held in place by an anterior and a posterior bandage tied under the opposite axilla. (Photographed on the living model by Mr. J. M. Bertolet.)

Dr. G. W. Spencer, one of my assistants, has devised an improved yet simple apparatus for employing this method. It consists of a piece of leather placed under the opposite axilla, and held in place by cords over

FIG. 11.



the shoulder. An anterior and a posterior strap, attached to this axillary leather, hook under the tubing, hold it in place, and can be tightened at will. It is a very efficient means of applying Moore's method. (Fig. 11.)

d. Wyeth's method by pins and the elastic tubing. Mr. Treves¹ says: "The method of controlling bleeding by means of an elastic band, which is carried across the axilla and brought well up over the point of the

¹ Oper. Surg., vol. i. p. 384.

shoulder, is strongly to be condemned as useless and dangerous. In such a method the axillary artery is compressed mainly against the humerus. At the moment of the disarticulation the band is apt to slip. It is in the way of the operator, and cannot with any ingenuity be made trustworthy."

Evidently, as he does not refer to them, he means the use of the band as in Esmarch's method, without any pins or bandage, to hold it in place. If so, his criticism is most just. But I am fully convinced that if any surgeon will try the method as outlined below, he will find such satisfaction in its use that he will abandon all other methods in favor of this. I have assisted my colleague Prof. Brinton¹ twice, and I put on record in this paper two other recent cases, with illustrations of the method. The satisfaction and absolute security that I have had in this very serious operation are such that in an amputation at the shoulder-joint I now feel as confident of my ability perfectly to control the hemorrhage as I do in an amputation of the forearm.

This method may properly be called Wyeth's method, as it is essentially an application of his hip-joint method to the shoulder. In fact, it preceded his method of bloodless amputation at the hip-joint, which was suggested by its prior use at the shoulder. In 1888, in removing the outer half of the clavicle, the glenoid, acromion and coracoid processes, and part of the body of the scapula, he first used the pins and rubber tube.²

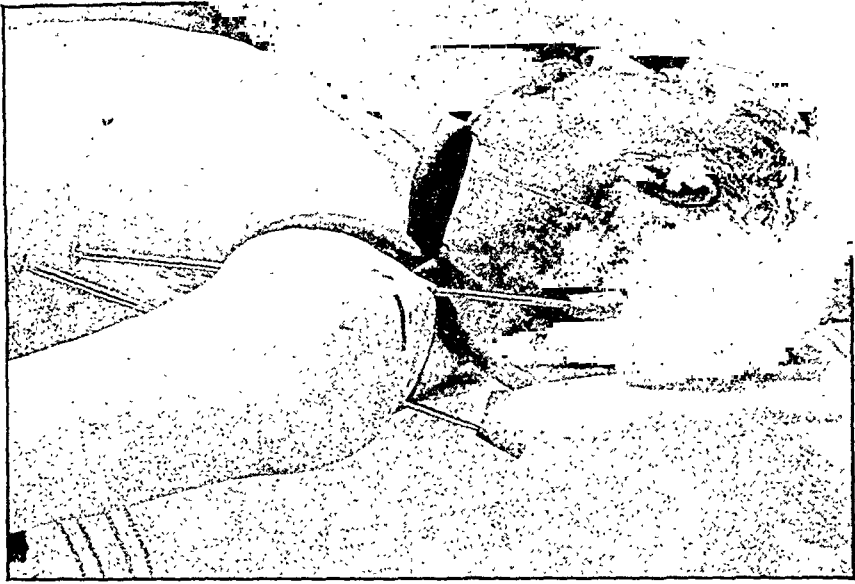
The operation I have performed as follows: The patient is brought to the edge of the table with the shoulder projecting somewhat beyond the edge. The arm is held at a right angle to the body. Two sharp-pointed cylindrical pins, eleven inches long and one-quarter of an inch in diameter near the head (No. 20, French catheter scale) are used. I have found that a good deal of force is required to push the pins through the tissues, and would suggest that the points be made triangular, like that of a trocar, to facilitate their introduction. The anterior pin is introduced through the middle of the anterior axillary fold (tendon of the pectoralis major) at a point a little nearer to the body than what may be called the centre of the fold transversely. The point of emergence of the pin is of much greater importance than the point of insertion; this should be *an inch within the tip of the acromion*. (Fig. 12.) The pin being pushed through, the point is protected by a sterilized cork. The second pin is now introduced at a corresponding point through the posterior axillary fold (tendon of latissimus dorsi), emerging again an inch within the tip of the acromion. Some little care is needed to avoid striking the spine of the scapula. The exact point of emergence is as I have said, important, in order to avoid the precise objection which Mr.

¹ Annals of Surgery, 1893, xviii. 321.

² Med. News, Dec. 9, 1893; N. Y. Med. Record, June 24, 1893, and Jan. 13, 1894.

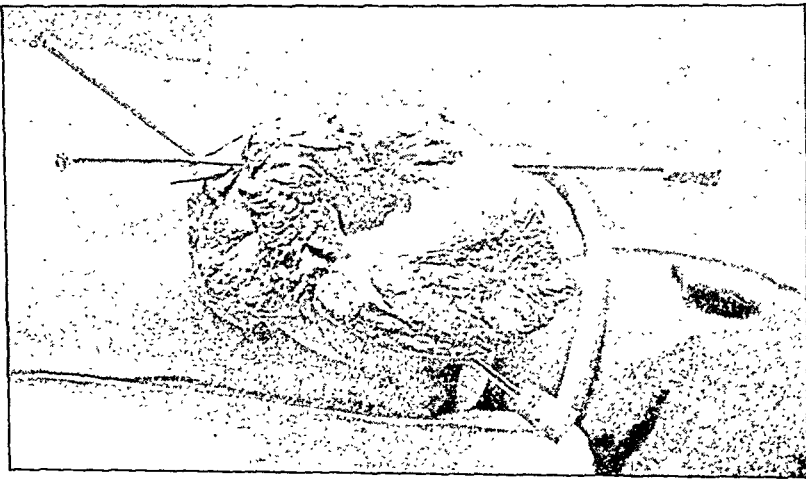
Treves adduces, namely, that if the pin emerges near or at the tip of the acromion, the moment the head of the humerus is removed the

FIG. 12.



Showing Wyeth's pins and the rubber tubing in place. A piece of black court-plaster indicates the tip of the acromion. (Photographed on the cadaver by Mr. J. M. Bertolet.)

FIG. 13.



Showing how complete is the exposure of the inner surface of the flaps and of the glenoid cavity after disarticulation by Wyeth's method. In line with and just below the horizontal pin are two matches in the artery and veins. (Photographed on the cadaver by Mr. J. M. Bertolet.)

tubing is apt to slip downward, compress the two flaps against each other, and thus hide the cavity formerly occupied by the head of the

humerus. The vessels may then retract and bleed freely in this cavity, and being entirely inaccessible except by removal of the apparatus, will require ligation of the subclavian, as in Allis' case, or if the tubing is removed copious hemorrhage will follow before the vessels can be caught. This very difficulty arose in the first case in which I assisted Prof. Brinton, but the tubing slipped down to such a moderate extent that we were able to secure the vessels with little difficulty and after only a moderate loss of blood. In the later operations in which I have used it, and have been more careful as to the point of emergence of the pins, no such complication arose. In one of my recent operations, after the arm had been entirely removed, so complete and perfect was the hæmostasis that I stopped for a moment to photograph the perfectly dry flaps before applying any ligatures. Unfortunately the focussing was not accurate enough to use the photograph, but the fact that I was able to wait and take the photograph shows how complete was the arrest of hemorrhage.

The pins being placed in position, a piece of black rubber tubing half an inch in diameter is then wound tightly around the axilla and shoulder on the hither side of the pins. It is important that this tubing should be the pure black rubber, which is very elastic, and not the far less elastic white rubber tubing. The disarticulation having been effected, the main vessels and all visible smaller vessels are tied and the tubing quickly removed. All other spurting vessels are then seized with hæmostatic forceps. I have not troubled myself to remove the pins until after seizing the vessels, so little have they been in my way. The punctures made by the pins heal quickly and are absolutely of no importance.

That the elastic compression of the vessels is by far the most secure method in all amputations is now, I think, unquestioned. In the limbs this can be secured very readily by the ordinary Esmarch methods, but at the hip and the shoulder the difficulty has always been to retain the elastic tubing in place. The only object of the pins is to hold the tubing in place and prevent its slipping. I feel quite confident that anyone who will adopt the method in the manner above indicated will abandon definitively all other methods in favor of this, excepting in emergencies, which, of course, can never be subject to fixed rules.¹

The following are two cases in which I have recently done the operation with the greatest satisfaction:

CASE III. *Amputation at the shoulder-joint for osteo-sarcoma of the humerus; recovery; recurrence by general sarcomatosis.*—Miss M. G., aged twenty-three years, was first seen in consultation with Dr. Dercum, who had charge of Dr. S. Weir Mitchell's wards at the Orthopedic Hospital and Infirmary for Nervous Diseases. She had been sent there for supposed neuralgia of the arm. About four months before her

¹ Cf. Harvey's "ruler" method.

right arm below the shoulder began to pain her. The pain was so great that she was unable to sleep; this caused considerable loss of flesh. In addition there was marked atrophy of the shoulder muscles. Three weeks before, a small lump appeared on the outer surface of the humerus, barely perceptible to touch. The pain of late has been rather less than it was before, and more intermittent.

Status præsens. June 17, 1893. A slender girl. The right deltoid is markedly wasted and the surgical neck of the humerus somewhat thickened. Vertical measurement from the armpit shows the right side to be three-fourths of an inch and the circumference of the humerus at the surgical neck one and three-quarter inches larger than the other side. Palpation shows a thickening—not now a lump, but a thickening which extended all around the bone as a sort of collar. My diagnosis was an osteosarcoma, and my advice was that an incision should be made in order to verify the diagnosis; and if verified, immediate amputation at the shoulder-joint should be done. This I desired to do at once. Her mother and brother (a physician), however, were so loth to have anything done that I consented reluctantly to wait until five days later.

Operation, June 22d. Since the 17th there has been a distinctly perceptible increase in the thickening around the bone, which confirms me in the diagnosis of a malignant growth. Ether. When lifting her on to the table the nurse accidentally let fall her right arm from a distance of not over four inches, and the humerus was fractured. Wyeth's pins were introduced, the rubber tubing applied, and an incision made down to the bone, which was found to be so soft that the knife easily penetrated it. Larrey's amputation at the shoulder-joint was then done. As little beyond mere skin was taken as possible. The capsular ligament seemed infiltrated and was dissected away with great care close up to the glenoid. The hæmostasis was perfect, not a drop of blood being lost excepting that in the extremity. The vessels were tied and the band taken off. Instantly a large jet of blood showed one vessel which I had not seen, and therefore not secured. It was seized by my thumb and finger before more than an ounce of blood had escaped, and was then secured. A great deal of trouble was caused by the numerous vessels which had to be ligated, requiring the application of thirty-five ligatures. This also was a very threatening feature to my mind, as it showed the vascularity of malignancy. A drainage-tube was inserted and the wound closed.

28th (sixth day). Her temperature has never risen above 98.8°. The first night she slept six and one-half hours; last night eight hours; begged for a potato to stay her hunger, and wanted to know when she could sit up out of bed. The stitches were all removed to-day (sixth day), and she was allowed to be out of her bed, the wound having healed by first intention throughout. The drainage-tube was removed at the end of twenty-four hours.

Some cultures were made from the interior of the bone at the seat of the fracture, and Dr. Kyle reported on them as follows:

"From the tubes which had been inoculated, stains showed the presence of numerous bacteria, from which two were isolated, *i. e.*, *staphylococcus pyogenes aureus* and another which I believe to be *streptococcus pyogenes*. These destroyed what other germs were present, for by the second inoculation these two alone remained; no cells were found. The pathologist's report as to the nature of tissue and bone, of course, will

determine whether it be malignant, but from a bacteriological standpoint I would say it was osteo-myelitis."

Dr. Charles W. Burr reported as follows on the specimen:

"The arm of Miss B. gives evidence of sarcoma. As you know, Dr. Kyle found the micro-organisms of pus in some fluid from the humerus. I think the explanation is as follows: First, an osteo-sarcoma; secondly, in it a focus of secondary inflammation."

May 10, 1894. In the summer of 1893 the growth returned at both ends of the right clavicle. In the autumn a faithful and persistent trial of the effects of inoculations of the products of erysipelas and the streptococcus prodigiosus furnished by Dr. W. B. Coley, of New York, was made, but though reactions were obtained after some of the inoculations, no perceptible effect on the growth was perceived. During the winter of 1893-94 growths appeared at four points on the head and probably internally. It seems likely that her life will be terminated within the next month.

CASE IV. *Amputation at the shoulder-joint for traumatic neuritis; recovery.*—My object being to record rather the surgical than the neurological aspects, I shall report this case very briefly, reserving the fuller details for another occasion.

Mrs. J., aged forty-three years, was admitted to the Orthopedic Hospital and Infirmary for Nervous Diseases, under the care of Dr. Morris J. Lewis, September 5, 1892. Twenty-two years ago she struck the back of her right hand on a grate between the first and second metacarpal bones. The hand swelled immediately and was very painful. Six months afterward two inches of a nerve are said to have been removed from the back of the hand, but immediately after the operation there was no numbness to touch. The pain became more severe, and gradually a universal neuritis of the entire arm, most marked in the ulnar nerve, set in.

I first saw her in January, 1893. Everything had been done therapeutically, and on January 16th, at the request of Dr. Lewis, I stretched the brachial plexus in the neck. On February 4th, no permanent good having come from the stretching of the brachial plexus, I stretched the ulnar nerve in the axilla, and later, on May 27th, I excised three and one-eighth inches of the ulnar nerve.

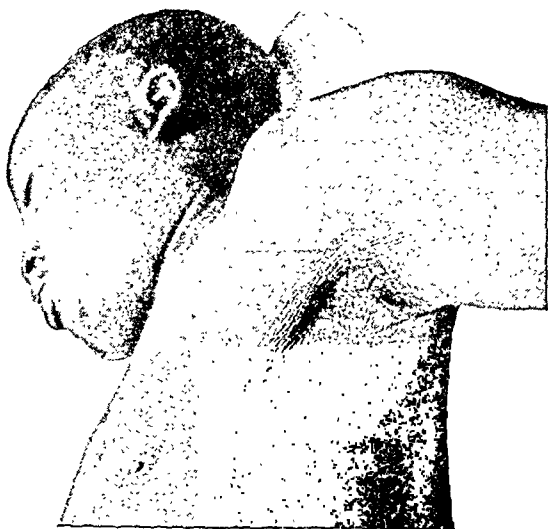
Her arm having become absolutely useless, and also a great burden, as she had to carry it around all the time, she begged for the relief which amputation would afford. Accordingly, the pain being still no better, on April 12th, 1894, I amputated the arm at the shoulder-joint by Wyeth's method, with pins and elastic rubber tubing. The flaps were so completely thrown back and bloodless after the disarticulation, that I had ample time to take a photograph of the flaps in order to show how entirely the glenoid cavity and the inner surface of the flaps were exposed and accessible. The stump was so vascular that, although the patient was a slender woman, and with a shrunken arm, forty-eight ligatures were required before the hæmostasis was satisfactory. On the fifth day half the stitches were taken out, and on the ninth day all of them were removed. A drainage-tube was used for forty-eight hours. A slight later infection took place at both ends of the drainage wound, which delayed the definitive healing, but all the rest of the wound was well in nine days after the operation.

May 10th. She made a speedy recovery and is much better, although

not entirely cured of her neuralgic pains. In fact, from the start I advocated division of the posterior nerve-roots within the spinal dura, but she has never been willing to have this operation done, and hence the various attempts at relieving her by the operations already mentioned.

II. AMPUTATION AT THE SHOULDER-JOINT IN CASES IN WHICH THE AXILLA IS INVADED SO HIGH THAT WYETH'S PINS CANNOT BE USED. In 1812 Delpech¹ proposed to make "an oblique incision extending from the external third of the clavicle to an inch above the inferior border of the great pectoral muscle. We thus discover and can cut, near to its origin on the coracoid process of the scapula, the lesser pectoral. The index finger is then carried through the cellular tissue along

FIG. 14.



Showing the line of the incision between the deltoid and great pectoral muscles. (Photographed on the cadaver by Mr. J. M. Bertolet.)

the serratus magnus muscle, then the subscapular . . . and is used as a hook in order to draw outward the mass of vessels and nerves. The artery is always situated at the anterior part of the mass, is surrounded and, as it were, indicated by the two roots of the median nerve, and nothing is easier than to surround it with a ligature which will embrace nothing else. This process appears to me preferable in that it produces but little injury to the parts, that it leaves a certain space between the ligature and the trunk, and permits temporary compression of the subclavian artery above the clavicle on the first rib." He states that he has only done this operation, however, on the cadaver. Fig. 14 on the cadaver illustrates the site of the incision. With modern antiseptic methods and

¹ Dict. des Sci. Méd., tome i. p. 289.

modern retractors and the electric forehead-light, or even without the latter, this procedure can be employed with much greater advantage than formerly. In addition to this if it is necessary to secure more room modern methods permit us to divide the fibres of the muscles on either side of the incision parallel to the clavicle, and to restore their continuity by suture. The advantages of this procedure are:

1. That it gives us wide access to the axilla, especially to its apex, where the vessels lie.

2. We can determine with ease how far and how great is the invasion of the axilla. If the invasion is so extensive as to make an operation hopeless, we can abandon the operation and the patient recovers within a very brief time.

3. If, on the other hand, it is decided to proceed with the operation, the incision already made not only admits of the ligature of the vessels but also serves as the inner part of the deltoid incision. The vein, of course, should be tied as well as the artery.

I have employed this method once in a case of amputation at the shoulder joint in which a sarcoma of great size had invaded the axilla nearly to the clavicle. Six months have elapsed since then, and the patient is entirely well. (See Case V. below.) The ease with which the operation was done and the paucity of hemorrhage during its performance have commended it to me very seriously. In another case in which I recommended it to the attending surgeon, he deemed it best not to adopt the procedure, but to proceed by the ordinary method, the vessels in the inner flap being compressed by the thumbs of an assistant. A large amount of blood was lost during the amputation at the shoulder, and when the axillary mass was removed, as the second step of the operation, the same vessels were cut again at a higher point, and such severe hemorrhage followed that the patient died shortly afterward. In a third case in the practice of my colleague in the Jefferson Hospital, Dr. Hearn, the incision was made and the dissection was then carried out sufficiently extensive to decide that complete removal of the axillary mass was impossible; the operation was therefore abandoned and the wound was well in a very few days.

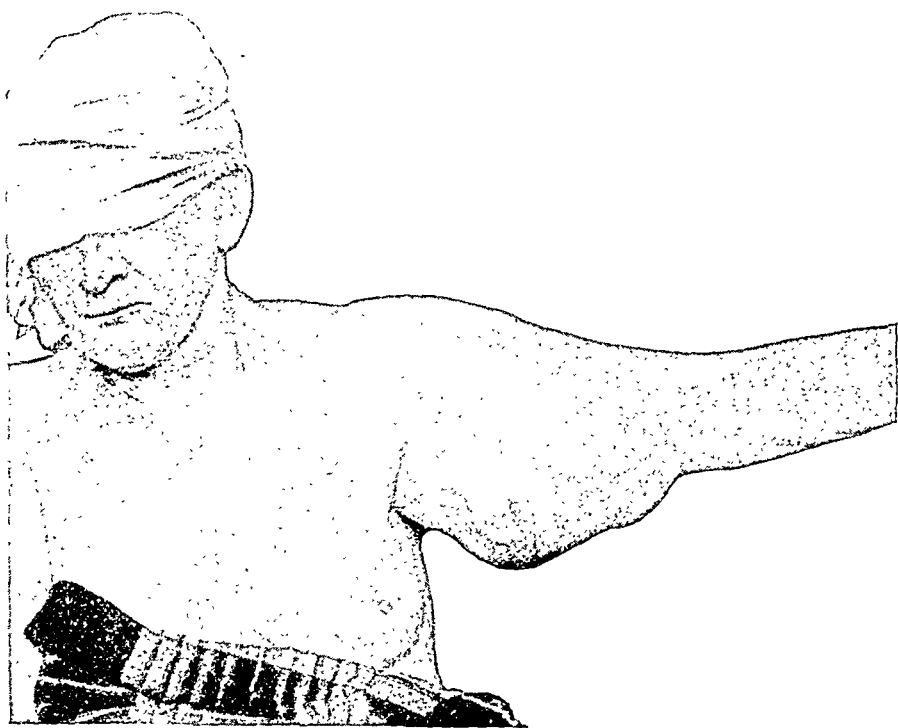
The following case illustrates the method, and is peculiar in the cause and duration of the disease:

CASE V. Amputation at the shoulder joint for a large sarcoma of the arm and involving the axilla; recovery.—Miss S. J. G., aged fifty-six years, Christiana, Lancaster County, Pa.; was first seen at the Jefferson College with her nephew, a student in the Jefferson Medical College, November 7, 1893. Her family history is negative. She is a dress-maker by trade, and has never been ill before. Ceased menstruating six years ago.

Forty years ago, when she was about fifteen or sixteen years of age, she cut herself in the palm of her left hand. A short time after this she

observed a lump the size of a grain of corn in the left armpit. This remained stationary for a year or so, and then began to grow, finally reaching the size of a hen's egg. The tumor remained permanently of about this size until September, 1892. It then began to grow rapidly. She consulted a local physician, who advised her to let it alone. Its present dimensions are as follows: circumference, twenty-three inches; vertical diameter, ten inches, from the level of the acromion downward. (Fig. 15.) It extends into the axilla so far that it would be impossible to place Wyeth's pins and the circular elastic tubing sufficiently high to remove all the diseased tissues. Apparently there are no separate glands involved. The tumor is hard and soft in different places, at points

FIG. 15.



Sarcoma of the arm and invading the axilla. (Photographed by Dr. C. A. Weaver.)

almost fluctuating. It is freely movable. The pain has been very slight. Her general health is good. Urine normal; specific gravity 1022; no albumin or sugar. Diagnosis sarcoma.

Operation, Jefferson Medical College Hospital, November 9, 1893. An incision was made from the clavicle nearly to the axilla in the interval between the deltoid and the great pectoral. The muscles were separated from each other, and in order to give more room, some of the fibres of the pectoral were divided. In a few moments I entered the apex of the axilla. I found that the growth had extended well up toward but not to the clavicle, and I was able to ligate the artery just as it changes from subclavian to axillary. The artery lay directly behind the vein in the supine position, and so deep that it could only be reached by ligating, dividing, and turning aside the vein. The incision already made was then utilized in making the deltoid flap. This was dissected away from

the bone, and disarticulation was effected with very little hemorrhage. The vessels which spurted in the deltoid flap and some on the pectoral side were quickly caught with hæmostatic forceps. The glands in the axilla were thoroughly cleaned out. The flaps were then united with silk-worm-gut, and two drainage-tubes placed in the wound.

The ease with which the operation was done and the small amount of hemorrhage were most satisfactory. Probably, excepting from the arm, not over four ounces of blood were lost in all. The arm and the blood from it were given to Prof. Coplin for examination.

The drainage-tubes were both removed on the third day. I retained them as long as this because of the very considerable oozing which took place. On the seventh day I removed five of the stitches, and on the sixth day reintroduced the drainage-tubes, for the reason that on the fifth day, although the temperature only rose as high as 101° , infection took place, followed by profuse suppuration. There was considerable odor, and small masses of necrotic tissue came away. Toward the end of the third week I reopened the central part of the wound in part, so as to give freer exit to the pus. The two ends where the drainage-tubes had been soon closed, and the discharge escaped entirely at the middle.

She left the hospital on December 16th, her temperature having been practically normal for nearly two weeks, with a good, granulating wound, all healed excepting at the centre.

Dr. Coplin reports that the growth is a mixed-cell sarcoma, and that there were peptones found in the blood, with a moderate increase in the number of leucocytes.

May 10, 1894. The patient is in good health.

III. CONTROL OF HEMORRHAGE IN CASES IN WHICH IT IS NECESSARY TO REMOVE THE ARM, THE SCAPULA, AND THE CLAVICLE—THE INTERSCAPULO-THORACIC AMPUTATION OF THE FRENCH. This formidable operation was first done by Ralph Cumming, a surgeon in the English navy, in 1808, on account of a gunshot injury; in 1830, by Gaetani Bey for an injury by an explosion. The next four operations, all for disease, were all done in the United States: by Dixie Crosby, of New Hampshire, in 1836, for carcinoma; by Twitchell, also of New Hampshire, in 1838, for malignant disease; by George McClellan, in the same year and for the same cause; and by Mussey, in 1845, for a sarcoma. All these first six cases recovered. Since that time the operation has been done with increasing frequency, as our methods have improved and as we have recognized the fact that such an extensive amputation gave a much better promise of permanent cure, especially in sarcoma of the upper end of the humerus.

In the sixth edition of Ashhurst's *Surgery*, 1893, p. 135, are recorded 17 cases in which the upper extremity had been torn off by accidental violence and which terminated favorably, and 89 cases in which these parts have been removed by operation, with 67 recoveries and 22 deaths. To these should be added 14 cases done by v. Bergmann,¹ which all

¹ Nasse: Sammlung klin. Vorträge, Neue Folge, No. 86.

recovered with the exception of one—an extraordinarily favorable showing. Von Bergmann's fatal case was a very remarkable one. He found that the sarcoma had extended through the subclavian vein to the superior vena cava, and to prevent a fatal hemorrhage he resected the sternum and tied the superior cava. The patient died very promptly. Probably there are other cases, but I have not searched for them, as it is not intended in this paper to consider results so much as the methods of dealing with hemorrhage.

The key of the situation here is, of course, as Berger in his capital monograph, *l'Amputation du Membre Supérieur*, 1887, has insisted, is the perfect security of the hæmostasis. The details of the procedure for arresting hemorrhage have varied somewhat with different authors as follows: 1. Simple compression of the subclavian artery. 2. The artery has been compressed after resection of the clavicle. 3. The subclavian has been ligated prior to beginning the amputation proper. 4. The middle half of the clavicle has been resected and the artery tied. 5. Wyeth¹ first tied the artery, then formed his flaps, and when the arm, clavicle, and scapula were only connected with the trunk by the vein and nerves, secured the vein and cut the nerves. This seems to me a very dangerous procedure, as the weight of the arm might easily tear the vein and allow the entrance of air. 6. The artery and vein have both been tied after resection of the middle portion of the clavicle. This seems to be by far the preferable method; its advantages being thus enumerated by Berger:

It absolutely prevents the hemorrhage resulting from division of the axillary artery and its branches.

It diminishes the amount of blood lost during the operation.

It absolutely prevents the entrance of air into the vein, which has been the cause of several deaths.

It permits of a large opening of the space between the upper extremity and the chest by section of the greater and lesser pectoral, and with almost no loss of blood.

And finally it enables us to divide the posterior attachments of the upper extremity (where the arterial circulation is still going on) at the end of the operation.

The preliminary resection of the clavicle and ligation of the vessels is by no means even itself easy, especially in cases in which the disease has invaded the clavicular region, or in which the arm has been torn off and the vessels have retracted. Thus, in a pathological case, Macnamara was unable to find the artery, and in a traumatic case Parise was equally baffled in his endeavors to find the vein. (Berger.)

The steps of the operation may be described as follows:

¹ New York Medical Journal, January 17, 1891, p. 57.

1. The resection of the clavicle. An incision is made on the line of the bone and directly down to it. The soft parts, including the periosteum if it can easily be done, are well separated from the bone largely by a blunt dissection. A retractor or periosteal scraper being introduced under the clavicle, the middle half of the bone is resected obliquely from above downward and outward. It is not necessary, nor even is it best to resect the inner end of the clavicle. In 1837 Mussey did this, with the result that air obtained entrance to the vein—in spite of which, however, his patient recovered.

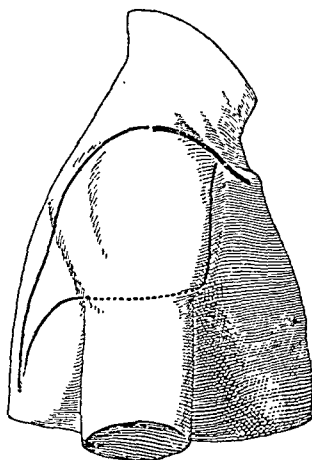
2. Ligature of the artery and vein. As pointed out by Berger and Farabœuf, it is best to search for the artery just at the point where it becomes the axillary by an incision of the periosteum of the clavicle, if this has been left, and of the subclavius muscle. "In applying the ligature at this level we find a noteworthy landmark in the presence of that branch of the brachial plexus which goes to the great pectoral. This branch is easily seen and still more easily felt with the finger. It passes obliquely in front of the artery, leaves the vein on its inside, and we can easily guide ourselves by the visible and tangible relief made by this nerve, and find at will either the artery or the vein without having recourse to the tubercle of the first rib." (Berger.) In my own case (*vide infra*) this nerve was not seen. It is best, as a rule, first to tie the artery with two ligatures and divide the vessel between them, and then to tie and divide the vein. If this order be followed, the vein is lessened in diameter, its ligation is less difficult, and if it be torn, as happened to me in the case related below, the wound is not flooded with blood, and the vessel can be much more readily secured. If the vein be greatly distended so as to obscure the artery, it may occasionally be best to tie it first with two ligatures and divide it in order to obtain access to the artery.

Should the vein be accidentally punctured or torn, the great danger, of course, is the entrance of air. Instantly the surgeon should cover the aperture with his finger and temporarily secure the vessel by means of hæmostatic forceps. He can then isolate, ligate, and divide it. The vessels being secured, the flaps are then formed. It is best, as a rule, first to make the anterior incision, as that gives us access to the axilla. Division of the greater and lesser pectoral muscles and of the brachial plexus then allows the arm to fall away from the trunk, thus exposing widely the space between the scapula and the chest. Next, the posterior flap is fashioned, the soft parts being rapidly dissected away over the scapula, and the muscular attachments to that bone divided. The bleeding vessels are readily seized by hæmostatic forceps.

The exact mode of making the flaps varies, and must be determined in each case by the character and extent of the disease. The typical posterior incision of Berger (Fig. 16) prolongs that over the clavicle for

its resection and the ligature of the subclavian down to the inferior angle of the scapula. The anterior goes vertically downward between

FIG. 16.



Incisions for the anterior and posterior flaps in amputation of the entire upper extremity. (BERGER.)

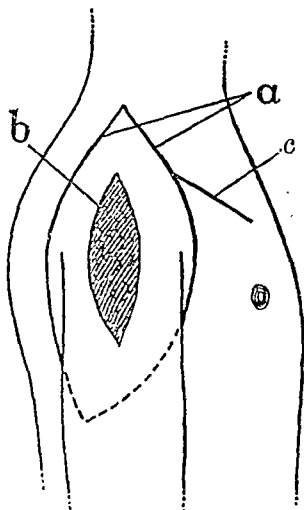
the arm and the chest, opening the axilla, and then meets the other at the inferior angle of the scapula. (Fig. 16.) Somewhat different incisions are given by Treves (Fig. 17), the dotted portions being on the back

FIG. 17.



Incisions for the two flaps in amputation of the entire upper extremity. (TREVES.)

FIG. 18.



a. Incisions for the two flaps in my own case of amputation of the entire upper extremity; b. The area of disease. (KEEN.)

of the body. In my own case, as the soft parts above the acromion were invaded, I made a much simpler incision, an oval beginning three inches above the acromion, and passing one in front and the other behind

the shoulder, and meeting in front of the inferior angle of the scapula. (See Fig. 18.) The flaps, if too large, should then be trimmed so that they will adjust themselves snugly to the sides of the thorax. This trimming may be rather frequently necessary, for it is difficult to judge beforehand exactly what should be the size and shape of the flaps. Fortunately, the removal of the clavicle, scapula, and arm leaves so small a stump (if one can apply this term to the rounded border of the chest) that a much smaller amount of muscular and cutaneous flap is required than would at first be thought probable.

As a rule, recovery follows in from two to three weeks. In my own case the stitches were removed on the fifth and seventh days, and the patient was out of bed eight days after the operation. The probabilities are very favorable in my case for permanent cure. Prof. Coplin reported that the case was one of giant-cell sarcoma, and as it had grown very slowly during the four years in which it had existed the probabilities are that the patient will escape any recurrence. In most cases, however, in which the bone is involved, recurrence of the disease has been the rule, but with our later experience it seems to me we ought to get in the future much better results. Observe, first, the low rate of mortality in the more recent operations—one in fourteen of v. Bergmann's. Note, secondly, that we can often amputate wide of the disease in consequence of the relative smallness of the flaps required to cover the chest-wall. Moreover, Thiersch's method of skin-grafting enables us to cover in immediately any moderate defect in the size of the flaps. In view of these facts I would urge, with Berger, that in all cases of malignant disease of the upper end of the humerus, or even of the lower end when it is already diffused, we should not content ourselves with mere amputation at the shoulder-joint, but should at the same time extirpate the scapula and clavicle. This is exactly in line with our modern methods of operation on the breast, in which the armpit is thoroughly cleaned out and a layer of the pectoral muscle removed in order to secure immunity. The very happy and marked increase in the percentage of cures in cancer of the breast should lead us to early and radical operation in cases of malignant disease of the humerus, and still more in similar disease of the soft parts of the arm.

The extraordinary fatality of osteo-sarcomata of the humerus and femur are well known. No one, so far as I am aware, has made a careful statistical investigation of the final results for the humerus, but Borck¹ has found that in eighty-seven cases of amputation at the hip joint for osteo-sarcoma of the femur, *not a single case* can be proved to have been permanently cured. A similar review for the arm would, I fear, show little if any difference from this doleful report. The result in sarcoma of the soft parts is much better. One reason for the frightful

¹ Arch. klin. Chir., xl. 941.

ultimate fatality of osteo-sarcoma which seems to be plausible, and which I believe has not heretofore been suggested, may be found in the physiological fact that the bone-marrow has a share, and probably an important one, in the production of the red blood-cells. If this be so it is possible that by this means the blood may be contaminated at its very fountain, and the disease being thus distributed, metastasis is readily produced, even if the disease has been so thoroughly removed that recurrence *in situ* does not take place.

CASE VI. *Amputation of the arm, clavicle, and scapula for sarcoma of the shoulder; recovery.*—Miss K. M., aged twenty years, of Gettysburg, Pa., was kindly sent to me at the Jefferson College Hospital by Dr. E. W. Meisenholder, of York, Pa., November 17, 1893. The family history is negative as to both growth and tuberculosis. She has always been in good health until four years ago, when she experienced a constant, dull, aching pain from the right elbow to the right shoulder. The only assignable cause for this was a fall a year earlier, in which she sustained a severe sprain of her right wrist. About a year after the pain appeared the shoulder began to swell slightly, attended with increased pain. The first appearance of the growth was at the insertion of the right deltoid muscle. From this it has gradually extended upward, until it now involves the outer end of the clavicle and the acromion and a part of the axillary border of the scapula. I have spoken of it as a growth, but really it was rather an induration and infiltration of the tissues, with but very little increase in size. It resembles not a little an atrophic scirrhus of the breast. The growth is very hard, almost as much so as cartilage, slightly granular on the surface, entirely immovable, and evidently attached to the bone. The shoulder-joint is also absolutely ankylosed. The pain is constant and severe. At times she has lost in weight, but is now gaining somewhat. Her general health is good. The urine is negative.

Operation, November 20, 1893. The scapula, as well as the humerus, was evidently involved, but how far the scapula was involved beyond its head was uncertain. The acromial end of the clavicle was probably involved, and the soft parts just above the shoulder, extending a little way into the neck, were dense and hard. It was necessary, therefore, to remove the entire upper extremity, including the clavicle and scapula. Berger's typical incisions, starting from the clavicle to form anterior and posterior flaps, would leave on top of the shoulder some of the diseased tissue. The only way in which the disease could be entirely removed, was by an oval incision beginning on the neck and ending near the lower angle of the scapula.

The arm was first bandaged with Esmarch's rubber bandage up to the deltoid insertion, in order to save her all the blood that was possible.

I then made an incision horizontally in the line of the clavicle, exposed the bone, and resected somewhat more than the middle third. I next proceeded to ligate the vessels, the artery first, in order that the arm should not be filled with blood, nor the vein so large and tense as it would be were it tied first, and thus prove an obstacle in reaching the artery. I found the task of ligating the vessels an extremely difficult one. The space between the scalenus anticus and the brachial plexus

was no wider than the artery itself, and access to it was blocked by a large vein, presumably the suprascapular. Finally, however, I secured the artery with two silk ligatures, and divided it. Securing the vein was still more difficult, as it was adherent to the fascia in front. In endeavoring to reach it, a large vein under the inner sawn end of the clavicle tore, and gave me much trouble, but finally, partly by a ligature around the tissues, in which lay the vein, and partly by a ligature which was applied temporarily around the tissues and around the sawn end of the clavicle, in a groove sawed in the bone so as to prevent the slipping of the ligature, I was able to control it. In addition to this, in trying to separate the subclavian vein from the fascia, a small hole was torn in the vein. I appreciated now especially the wisdom of tying the artery first, for had the same tear occurred before the artery was ligated the wound would have been flooded with blood, with all the embarrassments which would have attended such an accident. As it was, there was only intermittent hemorrhage, corresponding to respiration. I was naturally afraid of the suction of air into the circulation, and I distinctly heard a slight sibilant suction with inspiration, and saw some bubbles of air mixed with the blood. Instantly I covered the opening with my finger, and soon was able to place a pair of hæmostatic forceps between the tear and the heart. With not a little difficulty I was able finally to surround the vein with a silk ligature. The vein was then tied also beyond the tear, and severed between the two ligatures.

The flaps were then made by two incisions commencing about three inches above the acromion, passing down one over the anterior and the other over the posterior border of the axilla, to a point two inches in front of the lower angle of the scapula. The anterior incision crossed that over the clavicle nearly at a right angle. All the anterior tissues were first cut through, and the nerves divided, when the arm and scapula immediately fell away from the trunk.

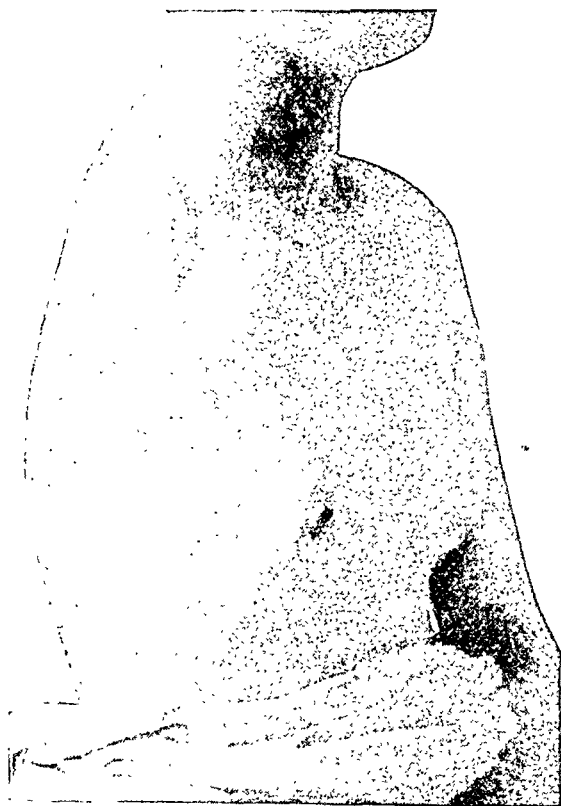
The posterior flap was then rapidly dissected from the scapula, when the operation was easily completed by severing the muscular attachments of the latter bone. No large vessels were cut, but nearly thirty ligatures had to be placed on small vessels, including a few small veins which bled persistently. The flaps came together easily, without trimming, a drainage-tube was inserted at the lower angle, and an abundant sterilized dressing applied.

During the operation she only required one dose of gr. $\frac{1}{20}$ of strychnine, and although the operation lasted nearly an hour and a half (most of which time was required in securing the vessels), she was put to bed in very good condition, with only moderate shock.

December 15th. On the second day after the operation the drainage-tube was removed from the upper end of the wound, and on the third from the lower end, and a little iodoform gauze was inserted in its place. Half of the stitches were removed on the fifth day, and the remainder on the seventh, and she was out of bed on the eighth day. Her temperature only once, on the evening of the operation, reached 101°, and fell to the normal at the end of forty-eight hours. Very slight suppuration occurred at the lower end of the wound, but the whole wound was closed at the end of ten days. On December 11th, three weeks after the operation, a ligature came away from the site in the subclavian vessels. Its discharge was preceded for two days by a little redness, but

no rise of temperature. My impression is that the escape of the ligature was due to necrosis, probably at the end of the vein. Had the ligature been infected it would have created more trouble, of course, and at a much earlier period. I had myself boiled the silk for an hour before the operation.

FIG. 19.



The patient was sent home to-day (twenty-fifth day) with the secondary opening over the subclavian vein almost closed, the rest of the wound entirely well. The photograph (Fig. 19) shows the result. The scar has faded to a marked extent.

Dr. Coplin reports that the growth is a myeloid sarcoma.

May 10, 1894. The patient remains in good health, and is attending college.

REVIEWS.

TUMORS, INNOCENT AND MALIGNANT: THEIR CLINICAL FEATURES AND APPROPRIATE TREATMENT. By J. BLAND SUTTON, F.R.C.S., Assistant Surgeon to the Middlesex Hospital, London. With two hundred and fifty engravings and nine plates. Pp. xvi., 511. Philadelphia: Lea Brothers & Co., 1893.

READERS of Mr. Sutton's former monograph on *Surgical Diseases of the Tubes and Ovaries* have awaited with no little interest the appearance of the present volume, in the expectation that it would contain much that was interesting and original. In this they have not been disappointed, though it must be acknowledged that fewer golden grains can be extracted from the chaff than in his former work. To one who is accustomed to the rigid subdivisions and formal arrangement of the average medical book, Mr. Sutton's collection of monographs on surgical pathology doubtless appear somewhat heterogeneous, but after all, there is a certain charm about a writer whose defiance of the ordinary rules of book-making is justified by the boldness and originality of his thoughts.

The purpose of the present volume is outlined in the introductory sentence of the preface, viz.: "Very early in the practice of my profession I became convinced of the great increase in diagnostic power that results from the combination of pathological and clinical knowledge." Reference is made to the importance of the author's studies in comparative anatomy, and his intention is expressed to exclude from consideration "all those conditions, often classed with tumors, which have been demonstrated to depend on micro-organisms." "The term cancer," he explains, "is employed in a sense equivalent to malignant adenoma, the species being determined by the gland in which the cancer arises."

From this preliminary statement the reader is prepared to encounter certain novelties in the way of classification, etc., which are less evident as he proceeds. A glance at the table of contents shows that the fifty-one chapters (excluding the two concluding ones on etiology and zoological distribution) are arranged under four main subdivisions. Under the first group are included connective-tissue tumors; under the second, epithelial; under the third, dermoids (including a rather common nondescript chapter on monstrosities); under the fourth section, on cysts, a wide range of subjects is discussed, from hydrocele to hydatids.

Connective-tissue tumors are divided into twelve genera, which are treated somewhat exhaustively, others in a more superficial manner. The chapter on lipomata is rendered especially valuable by a number of excellent original illustrations. The brief sections on surgical treatment appended to this and to the two succeeding chapters on chondromata and osteomata serve no special purpose, being too general to be of practical value to the reader; indeed they read like foot notes inter-

polated in the text—a criticism which applies to the majority of the corresponding sections throughout the book.

The chapter on odontomata is quite exhaustive, as compared with its companions—a peculiarity of the author's when he discusses a subject in which he is especially interested, even though it leads him to enter into minute details which are more attractive to the special student than to the general reader. To those who are not already familiar with Mr. Sutton's accurate observations in comparative osteology, the chapter furnishes an excellent index of the scientific value of his work.

The chapter on fibromata is rather diffuse, especial attention being given to keloids and molluscum fibrosum. For some reason the usual comment on treatment is omitted.

Seven chapters, or about fifty pages, are devoted to sarcoma, the subject being handled in a thorough and interesting manner, while the accompanying illustrations are especially valuable. The concluding section, on the results of operative treatment, presents an excellent *résumé* of the subject.

Considerable attention is paid to uterine myomata in the chapter on this form of neoplasm, as well as to similar growths developing from the ovary, tubes, and their ligaments. The term fibro-myoma nowhere appears, though in the chapter on fibromata there is a passing mention of the fact that "fibrous tissue often forms a very large proportion of many uterine myomata." Neuromata are carefully studied, a number of rare and interesting cases being cited.

At least a hundred pages are given to epithelial tumors, papillomata being discussed in the two initial chapters, following which is a short chapter on cutaneous horns, the illustrations being borrowed mostly from comparative pathology.

After a careful review of the subject of epithelioma, the author begins the study of adenoma and carcinoma, which he discusses together in the next six chapters. The author's peculiar views have already been alluded to; they are happily stated in the definition of the term neoplasms. "An adenoma may be defined as a tumor constructed upon the type of, and growing in connection with, a secreting gland, but differs from it in being impotent to produce the secretion peculiar to the gland it mimics." "Carcinomata are tumors that always grow from pre-existing gland tissue and mimic the parent gland, but they differ from adenomata in the fact that the structural mimicry is incomplete." We note, in passing, under the section on the treatment of cancer of the breast, a dogmatic statement with regard to opening the axilla which is decidedly at variance with the views of modern surgeons, viz.: "Of all the circumstances that modify the mortality of operations for removal of the mammary gland, none influence it so much as opening the axilla (!)" Again: "The axilla should not be opened unless there is really good reason to believe that its lymph glands are infected." We have previously mentioned the criticism that Mr. Sutton is hardly entitled to speak as authoritatively on surgery as on pathology.

The study of dermoids, it is unnecessary to state, is a thorough and scholarly one. The subject has always been a favorite one with the author, and no one is better fitted to discuss it *ex cathedra*. He divides these curious growths into four genera, viz.: Sequestration and ovarian dermoids, tubulo-dermoids, and dermoid patches. Under the head of tubulo-dermoids (those developing from canals) there is an interesting

chapter on bronchial fistulæ and cysts, and another on cervical auricles containing many curious facts. The illustrations throughout this portion of the book (though this may be said of the majority) are refreshingly new and instructive.

We can find no *raison d'être* for the chapter on monstrosities, even the explanation that "certain species are so apt to be confounded with dermoids." It is clearly out of place in a monograph on tumors, and only serves to weaken the pleasing impression produced by the preceding chapters.

A review of the four divisions on cysts arouses the unpleasant impression that considerable unnecessary matter has been introduced. How, otherwise, will the reader explain the extended reference to such conditions as hydrometra, hydronephrosis, diverticula, etc.? Strictly speaking, these may be "tumors," but if so why not simple hypertrophy and inflammatory enlargements? It is somewhat unusual to find hydrocephalus and cephalhæmatoma described as "neural cysts," even though these conditions, as well as diverticula, are classed under "pseudo-cysts." The description of cephalhæmatoma as the "swelling familiar to practitioners as the *caput succedaneum*, is clearly a slip.

Hydatids are thoroughly treated in Chapter II. The concluding chapter, on the cause of tumors, is somewhat disappointing because of its vague generalizations. Cohnheim's theory, the author believes, "cannot be regarded as in any sense applicable to sarcomata, epitheliomata, and cancers." Assuming that cancer is a malignant adenoma, he finds no difficulty in inferring that the ducts of glands which open on free surfaces are the channels by which presumably parasites are introduced, although all varieties of cancer cannot be thus explained. Assuming that all neoplasms, whether innocent or malignant, are originally local troubles, he summarizes their treatment in the final sentence of the book: *Thorough removal of the tumor, whenever this is possible, at the earliest possible moment.*

In reviewing so briefly a work which can only be properly appreciated after a careful perusal, we have perhaps laid too much stress upon its minor defects. The candid reader will make due allowance for certain peculiarities of the author, such as faulty arrangement, a somewhat rambling style, the introduction of minute details regarding subjects of little general interest, and a certain dogmatic tone which crops out here and there, and will recognize how minute and painstaking have been his special studies, and how admirably he goes to the root of knotty questions in pathology. The book represents a vast amount of personal experience and abounds in novel and suggestive ideas. From his excursions into less frequented by-paths, the author does not, after all, stray very far from the beaten track, and the practical bearing of pathology on surgery is kept constantly in mind. As before stated, the illustrations are new and excellent, and the foot-notes and references show evidence of wide research, though with a distinctly local bias. Although it will probably not be so popular in this country as his former monograph, we feel sure that it will be recognized as a distinct addition to the literature of tumors.

H. C. C.

THE THROAT AND NOSE, AND THEIR DISEASES. By LENNOX BROWNE, F.R.C.S.E., etc. Fourth edition. 8vo., pp. xviii., 734. London and Philadelphia: Lea Brothers & Co., 1893.

THIS fourth edition has been demanded so shortly after the issue of the third, that the author has had time to do little more than have the stereotyped plates of the last edition altered here and there to suppress some argumentative points and interpolate the results of some additional observations. The extensions are mainly in rhinological subjects—acute rhinitis, diseases of the cavities or sinuses accessory to the nose, etc.; while croupous rhinitis, dislocation of the columnar cartilage of the nasal septum, and perhaps some other conditions, appear as new subjects.

We note that the author returns to the treatment of chronic hypertrophic rhinitis with chromic acid, which he had long given up or disapproved of; and he even depicts his own applicator and describes his own method of using the caustic, which, however, varies slightly from that of other practitioners. He places rather more reliance, too, on the observations of Woakes than he formerly did, and while stating his reasons for the change in opinion, contends that the term necrosing ethmoiditis is misleading, as necrosis is not at all distinctive nor characteristic of ethmoiditis.

This fourth edition is better than the third, as the third was better than its predecessor. We continue to commend it to our readers, especially upon those subjects which present the positive evidence of the author's own experience.

J. S. C.

DER MORBUS GRAVESII (SOGENNANTEN MORBUS BASEDOWII.) Von DR. P. MANNHEIM, Arzt in Berlin. Gekroente Preisschrift. Mit 2 Tafeln.
MORBUS GRAVESII (SO-CALLED MORBUS BASEDOWII.) By DR. P. MANNHEIM, Berlin. Prize Thesis. With two plates.

THIS work is a distinctly valuable contribution to the study of that peculiar affection, Graves' disease. We are glad to see that the author, although a German, breaks away from the common German custom of calling it Basedow's disease, and gives the credit of the earliest clear description where it is due.

The study is based upon forty-one cases observed by himself and upon a review of the older and latest literature of the subject. The first section of the book is an elaborate and interesting history of the disease. In this the author shows carefully in what way the work of Graves was overlooked by many, and proves that his earliest publications regarding it appeared in 1835, while Basedow did not write until 1840. Although cases were described before the writings of Graves were published, yet the writers failed to recognize the true nature of the disorder or the peculiar complexus of symptoms which constitute it. The further history of the malady and the principal contributions to the subject up to the year 1860 are extensively referred to.

In the second division of the thesis the author analyzes the newer

investigations upon the subject, studying the disease under the headings of eyes; circulation; struma; skin; organs of respiration, digestion, and generation; fever and general condition; nervous symptoms; complications; diagnosis, etiology, prognosis, and course; and then takes up briefly the pathological anatomy. This chapter is intended as a supplement to the work of Moebius in that it considers chiefly publications which have appeared since his critical review of the subject issued a few years ago. Besides this it contains an analysis of the author's own forty-one cases. The chapter is a very interesting one. Of course it is not complete, discussing as it does only the results of the latest investigations. To have included all of Moebius' work would have made the volume too large; still, it would have rendered it unnecessary for readers to have possessed both books, and would in so far have been an advantage. In the short review of the pathological anatomy of the later cases the author lays particular stress upon the lesions which have been described as occurring in the medulla, and illustrates them by a plate taken from a case of Mendel's.

The third chapter is an exhaustive "Critic of the Theories." Among the theories of the disease which have been advanced the author reviews those of disturbed circulation, of disturbed action of the heart, of disturbance of the sympathetic nerve, and finally that which attributes the symptoms to a central disorder. After reviewing the various symptoms in their bearing upon the truth of the central theory he adopts this, viz., that the disease is due to a paralysis of the central portion of the cardiac vagus and of the medullary vasomotor apparatus. Proceeding further in his analysis he rejects the view that the central paralysis is of the nature of a neurosis, and accepts that which claims the necessity of anatomical lesions for its production. He reviews, too, and rejects the theory of Moebius, which considers Graves' disease as an affection of the thyroid, an opinion which was based upon the resemblance of the disease to myxœdema. Without any expression as to the correctness of Mannheim's position regarding the etiological relation of anatomical lesions, it yet seems to us that he too readily rejects the idea of the neurotic nature of the affection, and bases his claim upon too few discoveries upon the side of pathological anatomy.

In the last chapter are considered the writings of different authors upon the therapeutics of Graves' disease. As a result of his analysis Mannheim concludes that the treatment by drugs is almost never of direct value, except in so far as it relieves certain symptoms. He appears to think not much better of electrical treatment. He favors climatic influences and hydrotherapy simply for their effect upon the general health. Surgical treatment he opposes altogether.

Following this chapter are the clinical histories of his patients in detail, and finally a list of 285 authors to whom reference is made in the text.

The book is an excellent monograph on the disorder; or rather a critical digest of the work done on the subject. It will be of great value to those wishing to add to their knowledge of the disease the best and newest information regarding it. It is not intended for those desiring to read a systematic treatise upon Graves' disease, since it presupposes a considerable knowledge of it.

J. P. C. G.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE
MEDICAL SCHOOL AND HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

RATIONAL THERAPEUTICS.

DR. P. H. PYE-SMITH concludes a very readable paper with the statement that the list of specific remedies, mercury, quinine, ipecacuanha, iron, arsenic, and salicyl-compounds, is not a large one. He would urge the importance of (1) first giving fair play to direct and simple remedies. (2) Testing the efficiency of physiological remedies; to make sure that potassium acetate, or broom or resin of copaiba, does increase the amount of urine passed, and not give them with the vague notion that they do good in dropsy. (3) Using our true specifics, which are well tried and certain, thoroughly with confidence and perseverance, pushing the doses until we get some evidence of their physiological action. (4) Mixing our purgative, diuretic, and other physiological drugs, but always giving our specifics each by itself. Lastly, he would urge the uselessness of many and much-advertised new drugs, for which are claimed wonderful specific or physiological powers on the slightest possible grounds. It takes a lifetime to know how best to use opium, digitalis, and other trustworthy drugs.—*The Practitioner*, 1894, No. 310, p. 241.

A NEW AGENT IN THE TREATMENT OF EPILEPSY.

DR. PAUL GIBIER continues his report, made one year ago, of his use of hypodermatic injections of the cerebrum of the sheep. He reports the use of this agent in nine cases. In four cases, notwithstanding the persistence of the patients, the treatment did not effect any appreciable improvement, and the injections did not appear to be superior to the bromides. Of the two cases reported in the previous communication, in the first the improvement has persisted, and there are intervals of from two to two and one-half months without the seizures, which are milder. The attacks reappear

when the injections are discontinued. The attacks of *grand mal* have diminished to one-tenth of their former severity, while the *petit mal* has disappeared entirely. In the second case the improvement has continued, the progress being marked in the intelligence of the patient, who remains sometimes several weeks without any epileptic manifestations.—*New York Therapeutic Review*, 1894, No. 1, p. 1.

THE TREATMENT OF CHOREA.

DR. DUJARDIN-BEAUMETZ believes that the chorea of Sydenham can be divided (1) as to its rheumatic origin, and (2) that connected with hysteria. For the rheumatic chorea, sodium salicylate frequently leads to unexpected disappointments, and antipyrine seems to be the more active remedy; fifteen grains at each meal, in "sirop de punch," cure resulting in from two to three weeks. In the chorea of hysterical origin, antipyrine is inferior to potassium bromide. Exalgine has not given the good results recorded by several writers, although it has not been given in the large doses recommended. In severe cases, when antipyrine does not suffice, sleep can be obtained with chloral, which is well borne by children, even in large doses, forty-five to even seventy-five [!] grains in the twenty-four hours. If there are cardiac complications it is necessary to use great care in using cold douches, or, indeed, the ether spray, along the spinal cord. Gymnastics are inapplicable in the paralytic form, and impossible in those who cannot make the gymnastic movements; and in severe cases, instead of regulating they exaggerate the incoördination. In the period of decline they may be useful. For the hysterical form, potassium bromide in large doses, and hydrotherapy, give the best results. For the anæmic individuals it may be necessary to add tonics, or to administer arsenic at the same time with the bromides. Arsenic given alone is not believed to be a curative agent, but associated with the bromides it manifests its tonic properties, and as well prevents the bromide-acne. Massage, in the later stages, is indicated, and as well gymnastics, with the reservations above noted. In the paralytic forms the bromide is contra-indicated, and wrapping in the wet sheet is recommended. Subcutaneous injections of hyoscine hydrochlorate, $\frac{1}{8}$ to $\frac{1}{4}$ gr., may be used in severe cases. Above all, it is important to feed the patients, and to use metal cups instead of glass, thus avoiding accident.—*Bulletin général de Thérapeutique*, 1894, 10e liv., p. 193.

SLEEP, SLEEPLESSNESS, AND HYPNOTICS.

DR. S. V. CLEVENGER believes that it is doubtful if the bromides become substitution compounds in any of the animal tissues, further than to pervade the secretions and lessen activity by taking the place of nutrient materials. If bromide salt ingestion passes a certain point, distressing insomnia may result, probably from the anæmia exceeding what ordinarily occurs in sleep. Chloral in large doses may fail to do anything but cause distressing wakefulness and gastric irritability, especially in senile debility associated with heart disease; waste is but increased by chloral. Ergot has an indirect hypnotic effect, through its contraction of the bloodvessels, upon the muscles of which it acts directly. Phenacetine and phenocoll are, in effects, sedatives. Sulphonal has the advantage, that it can be given in hot tea or coffee without the

patient's knowledge. Trional and tetronal possess few if any advantages of the original drug (sulphonal), while it is claimed that the latter sometimes caused vomiting. Chloralamid requires slightly larger doses than chloral, but it produces a sleep more closely resembling the physiological than the latter, and it possesses the additional advantage that it does not irritate any mucous membrane. Apparently it is not contra-indicated by a weak heart or respiration. Of course, as to the time of its action, personal idiosyncrasy determines differences, but to no greater degree than with chloral, the average limit being from one-half to three hours intervening between the dose and its effect, the duration of sleep varying from two to nine hours. Hypnotic action may be classified as (1) derivation, such as removing irritative, quantitative, or qualitative causes; (2) elimination of quantitative or qualitative causes, as of some toxic agent; (3) reconstruction, by resupplying parts in states of defective nutrition; (4) minimizing activity until rehabilitation can overtake waste with supply; (5) restoration of normal function, as with digitalis or alcoholics. The ideal sleep-procurer would be one which abstracted nothing from the nervous system which it contained normally, nor added thereto anything deleterious; and as sleep is a process of repair or feeding of the nerves and their ganglionic centres, still more effective would be whatever caused sleep by repair of such waste; and unless credible evidence to the contrary appears in the course of time, we are in the possession of such a hypnotic in chloralamid.—*Journal of the American Medical Association*, 1894, vol. xxii., p. 325.

THE TREATMENT OF COMMON FORMS OF DYSPEPSIA IN WOMEN.

DR. ROBERT SAUNDY believes that the essential remedy is rest—rest in bed. The rule is to keep the patient in bed until she has eaten ordinary diet without any discomfort for at least three or four days. When the patient is first put to bed, only milk and bread should be allowed. If there is vomiting, only milk, once every hour. When the food is tolerated, additions can be made to the diet, such as minced chicken, cold baked custard pudding, dry toast, and weak tea; afterward minced mutton and mashed potatoes, and finally ordinary diet. Should there be great loss of flesh, massage and faradism must be employed daily. If hysteria complicates the case, isolation is absolutely necessary, and to be effective it must separate the patient from all communication, direct or indirect, with her relatives or friends, excepting those who have to do with her medical treatment. When the patient is well enough to go about, it is desirable to complete the cure by change of air and scene. When gastritis is present the use of ordinary tea is to be avoided; but if it is made with boiling milk, instead of water, its irritating effects are so much diminished that it can be taken without harm. Coffee, unless taken after meals, is usually mixed with so much milk that the tannic acid is precipitated, and the resulting beverage is one of the best that man has devised. Cocoa, in spite of its popularity, is an uninteresting, harmless kind of drink. In gastralgia, without organic disease, patients should be encouraged to eat; positive harm is done by dieting them. If a little weak alcohol helps their appetite they should take it, but, on general principles, spirits should not be recommended. Light wine or light

beer, or even stout, may be really beneficial, the last especially, from the large amount of dextrins and sugar it contains. In atony and dilatation, when there is distinct motor defect, fats should be taken sparingly or not at all, and some care must be exercised to avoid the use of indigestible food. When the stomach is irritated or inflamed, we must carefully exclude all pungent and acrid substances, chemical and mechanical irritants, and fermentable substances. When exercise is productive of fatigue it must be discouraged; it should be taken early in the day, and may with advantage be avoided later. Electricity may be used in atony and dilatation, applied by means of a stomach electrode—a large, well-wetted, flat electrode being applied externally. The stomach tube is useful in the rare cases of necessary feeding by this method. It is useful to wash out the stomach in retention of its contents, and it is necessary in decided dilatation. The best antiseptic for washing out the stomach is a 1 per cent. solution of sodium salicylate. Of the drugs used on account of the prevalence of anæmia, iron, as Blaud's pill, ferric and magnesium sulphates, of the tincture of ferric chloride. Strychnine is useful either combined with the iron, or, if that is not indicated, with a mineral acid. Since constipation is the rule in these cases, aperients are indicated, and the salines are the best. There is but little choice between the magnesium and sodium sulphates, the former being more disagreeable. The various mineral waters are recommended to be taken really hot. Mercury is of value in all cases of subacute gastritis, either as calomel or preferably blue pill, two five-grain pills, one to be taken at bedtime in succession or alternate nights, according to the extent of its action. Whether it acts as an antiseptic, or by unloading the bloodvessels, or both, we are not sure, but its good effects are manifest. Whenever there is evidence of irritation, furred tongue, icterus, or mucous vomiting, bismuth is indicated, to be given with sodium bicarbonate, powdered rhubarb, or with irritable bowels the rhubarb should be omitted. If there is a deficiency in the hydrochloric acid of the gastric juice, fifteen drops in a wineglassful of water may be taken through a glass tube every hour for four hours after each meal. Pepsin is much more rarely absent, and, if necessary, it can be administered.—*British Medical Journal*, 1894, No. 1735, p. 673.

THE TREATMENT OF THE URIC ACID DIATHESIS.

DR. M. MENDELSON observes that all remedies which are solvents of uric acid in test-tubes may not act as such in the body, and increase the amount of uric acid excretion in the urine. Lithium carbonate appears as the chloride in the urine, and piperazine, which in the test-tube dissolves seven times as much uric acid as does lithium, does not show any evidence of this property when taken into the body. Remedies which can be used for long periods of time without disturbance of nutrition of the gastric acid, are necessary. The use of mineral waters has limitations. During the past year investigations have been carried out concerning urecidin, a white, granular substance, which is remarkably soluble in water, and in aqueous solution, is of slightly acid reaction, so that if brought in contact with chlorides it forms only in part a combination, and therefore does not have an unfavorable influence upon gastric digestion. Although this remedy has no

direct action upon uric acid, yet after the internal use of this drug the urine acquires the property of dissolving the uric acid. Chemically, this remedy consists of a considerable proportion of sodium citrate, 67; beside sodium sulphate 27.5, and smaller quantities of sodium chloride, 1.6; and lithium citrate, 1.9. It is used in from fifteen to thirty grain daily doses, so that the urine is either faintly acid or at least neutral. With large dose, three to five drachms, slight diarrhoea may appear, but no other serious untoward symptoms.—*Verhandlungen des Zwölften Congress für innere Medicin*, 1894, S. 367.

THE ACTION OF PROPEPTONE AND PEPTONE UPON THE CIRCULATION.

M. J. E. ABELOUS states that the following facts are commonly accepted: 1. Peptones retard the coagulation of the blood; 2, they determine a temporary arrest of urinary secretion; 3, after a more or less prolonged period of agitation they determine a particular narcosis—a peptonic narcosis; 4, they finally produce a notable lowering of blood-pressure and a dilatation of the abdominal vessels. A series of carefully-conducted experiments (curarized dogs, injections of propeptones; curarized frogs, injections of peptones; separated heart of tortoise, solution of propeptone and of peptone) show that both these substances have a sensibly analogous and manifest action upon the circulation. They determine a temporary, more or less long, more or less marked fall of arterial pressure, this fall being coincident with the dilatation of the abdominal vessels. This vaso-dilatation is in part reflex and in part due to the action of the ingested substances upon the nervous centres. It is often, but not always, observed after injection, a diminution of the frequency of the cardiac rhythm, and that in spite of a simultaneous lowering of blood-pressure. This change of rhythm then can be attributed to a double origin: 1. Excitation of the bulbar cardiac regulatory centre, or, 2, direct action of this substance upon the intra-cardiac slowing apparatus. It is this last action which has been sought to be demonstrated.—*Archives de Physiologie*, 1894, No. 1, p. 53.

ACCIDENTS FROM SALOL.

M. JOSIAS reports an instance where the administration of fifteen grains, followed by thirty grains on the next day, gave rise to a scarlatiniform erythema, with spots resembling measles, and red papules. The urine showed the presence of both phenic and salicylic acids. Dujardin-Beaumetz believed that one cause for these symptoms was to be found in the renal impermeability which is set up by the ingestion of aromatics, as phenol. Bardet has found that in febrile conditions the aromatics act as antithermics and chilling, cyanosis, and rashes are not uncommon; therefore, in these cases care should be exercised, while in non-febrile cases accidents do not occur, even if the doses are large. A proof of this is found in the administration of large doses in dyspepsia. Jasiewicz from his own experience could not admit the absorption of this drug when used as a topical application, even in large doses.—*Journal des Practiciens*, 1894, No. 23, p. 273.

MEDICINE.

UNDER THE CHARGE OF

W. PASTEUR, M.D. LOND., F.R.C.P.,

ASSISTANT PHYSICIAN TO THE MIDDLESEX HOSPITAL; PHYSICIAN TO THE NORTHEASTERN
HOSPITAL FOR CHILDREN;

AND

SOLOMON SOLIS-COHEN, A.M., M.D.,

PROFESSOR OF CLINICAL MEDICINE AND APPLIED THERAPEUTICS IN THE PHILADELPHIA
POLYCLINIC; PHYSICIAN TO THE PHILADELPHIA HOSPITAL;

ASSISTED BY

AUGUSTUS A. ESHNER, M.D.,

ADJUNCT PROFESSOR OF CLINICAL MEDICINE IN THE PHILADELPHIA POLYCLINIC.

PULMONARY HYPERTROPHIC OSTEO-ARTHROPATHY.

DR. KERR (Bradford) records the following case (*Brit. Med. Journal*, No. 1728): A man, aged twenty-two years, previously healthy, had an attack of pleurisy in February, 1893, from which he made a slow recovery. In August following, aching pains and rapid enlargement of wrists and ankles took place in about three weeks, necessitating the use of larger gloves and boots ever since. There was free perspiration during illness, but appetite was not seriously affected. On examination he was well nourished, and with the exception of dulness and weak breathing over the right base, the chest was normal. There was slight morning cough, with expectoration free from tubercle bacilli. The thyroid gland was quite distinct, and the clavicles and bony thorax were unaffected.

"Both knee-joints were swollen, especially the right, the bones being enlarged, the joints distended but not tensely, and giving a fine crackling sensation on palpation. The enlargement about the joints was chiefly in the bones; the lower two-thirds of the radius and ulna were evenly and smoothly enlarged up to the ends; the wrist-joints seemed a little loose, but not distended; they gave the same fine crackling feeling; the carpal bones were not much thickened, the inter-phalangeal joints all enlarged from thickening about the bone ends. The soft parts were a little hypertrophied, the veins of the forearm not raised above the surface; the muscles were flabby in the arms and wasted in the hands. There was no œdema anywhere, but the hands looked puffy, the skin over the affected parts was thin, elastic, and smooth, with a pale rheumatic look, possibly from frequent perspiration; the fingers had the 'spindle-shaped' appearance, like the legs of a stool, the end phalanges being bulbous and over-extended. The nails were very large (*cf.* measurements), thin, much curved, and perfectly smooth, of a deep pink, almost livid, color. The lower extremities were affected, except that the nails were not so much enlarged as on fingers. The fists could not be quite clenched; the hypertrophied bones used to ache, now they were tender, so

that lifting a weight was painful from pressure. Height, 5 feet 4 inches; weight, 9 stone 7 pounds. Measurements: Figures in parentheses are mean of three individuals of same height and similar build. Circumference around right knee, $15\frac{3}{4}$ inches; around body of foot, $9\frac{1}{4}$ ($9\frac{1}{2}$); around malleoli, $10\frac{1}{4}$ (9); 2 inches above, 9 ($7\frac{7}{8}$); 6 inches above, $11\frac{1}{2}$ ($10\frac{5}{8}$); 8 inches above, $13\frac{1}{8}$ ($12\frac{5}{8}$). Length of great toe, $3\frac{1}{2}$ ($2\frac{1}{2}$) inches. Circumference thickest part of right wrist, $7\frac{3}{8}$ ($6\frac{3}{8}$); 2 inches above, 7 ($6\frac{1}{8}$). Length of hand, $8\frac{1}{4}$; middle finger, $4\frac{1}{4}$; nail of index finger, length 21 mm. (15); breadth, 23 mm., (14). Circumference of last phalanx of index finger, $2\frac{1}{2}$ inches ($1\frac{5}{8}$). Displacement of hand immersed to 2 inches above wrist, $22\frac{1}{2}$ ounces (16 ounces). The thick wrist, scarcely altered carpal region, long spindled fingers, and large curved nails show the diagnostic points differentiating from the short spade-like hand, with unaltered nails and sausage fingers, of acromegaly."

SYPHILITIC TUMORS OF SPINAL CORD SIMULATING SYRINGOMYELIA.

DR. BEEVOR (London) records the following case (*Lancet*, No. 3664): A gardener, aged fifty years, after two days' exposure to wet in July, 1892, began to drag the left leg. In a few hours he had weakness of the left arm and numbness of the right knee. "He noticed the weakness of the left limbs for a fortnight before admission, as well as wasting of the left arm; on the right side the numbness spread up to the groin, and during the last fortnight to the nipple. He had no pain till a week after the onset of the symptoms, when he began to have pain in the left shoulder, elbow, and wrist, and numbness in the left thumb and radial border of the forearm. There was no affection of the sphincters and no history of gonorrhœa or syphilis. On admission into the National Hospital for the Paralyzed and Epileptic in September, 1892, he had wasting of both the upper limbs, especially the left, with marked wasting and loss of power in the left serratus magnus, supinator longus, muscles of the forearm and intrinsic muscles of the left hand, as well as weakness of the left lower limb, so that he could only just raise the leg off the bed. Sensation was lost to pain, heat, and cold of the whole of the right leg and the right half of the trunk up to the fourth rib, while tactile perception was normal. The knee-jerk was excessive on the left side, and left ankle-clonus was present. Later, the loss of painful sensation spread up to the right arm (ulnar border) and left forearm, involving the radial border. There was loss of electrical reactions in the intrinsic muscles of the hand. Later he had paralysis of the sixth nerve of the right side, and he gradually became worse, and died on November 14th. On examination post-mortem two syphilitic tumors were found on either side of the brachial enlargement of the cord, the left one passing nearer the cord than the right, but the cord was too soft for accurate examination. Attention was drawn to the fact that loss of heat, cold, and painful sensations has lately been associated with syringomyelia when unattended by tactile anæsthesia; but in this case it seemed to have been caused by pressure of a growth from without." He had regarded the symptoms as pointing to disease of the gray matter, and he looked upon the case as one of syringomyelia, and had treated it accordingly. Iodide of potassium was given in small doses, but not pushed. The cord was so soft that proper sections could not be made, and the degenerating tracts were therefore not traced.

BASAL DRAINAGE IN CHRONIC HYDROCEPHALUS.

MR. PARKIN (Hull) records another successful case of this method of treatment (*Lancet*, No. 3664). The child first came under observation at the age of eleven months. In three months the circumference of the head had increased one inch to eighteen and a half inches, and its general condition was becoming less satisfactory. After admission to the hospital in April it rapidly became worse. It lay perfectly quiet in bed, never moving its limbs and not uttering the least cry, even when taken up roughly and shaken violently from side to side. The eyes were open and staring; the head was retracted. Food was taken badly, and it vomited twice or three times in the twenty-four hours. Pulse, 84. The anterior fontanelle was very hard, with no pulsation.

A little chloroform was given, and the under surface of the cerebellum was exposed about one inch below the superior curved line of the occiput and half an inch to the right of the middle line. The bone was easily gouged away, exposing the tense dura mater. After incision of the latter a few drops of fluid came away, but the passage of a probe into the subarachnoid space and gentle raising of the cerebellum allowed the exit of a quantity of clear cerebrospinal fluid. A horsehair drain was inserted into the subarachnoid space and was brought out at the inner end of the wound, which was sewed up with a continuous suture. On the next day the condition of the child was most satisfactory. The eyes were opened intelligently, and no part of the sclerotics was visible above the pupils. The anterior fontanelle was soft and pulsated. The child smiled from time to time, moved its limbs about, and recognized its mother at once. Recovery was uninterrupted. The method of operating adopted by Parkin is described fully in the *Lancet*, July 1, 1893.

LUPUS TREATED BY THYROID EXTRACT.

BYRON BRAMWELL records two cases of lupus treated with good results by thyroid preparations. He was led to try this remedial agent in these cases partly in view of the favorable results obtained in other skin affections, notably psoriasis, and more especially owing to the liability of myxœdematous individuals to tuberculosis.

The first patient was a girl, aged sixteen and a half years, with extensive lupus of the face. It had commenced at the age of seven, and now involved the nose, left cheek, and upper lip, and a ring of scabs extended from each angle of the mouth down to the chin. An extensive cicatrix in which there were many ulcerated patches and lupus nodules covered the cheeks, and there were several outlying nodules in the surrounding healthy skin. The general health was good.

Thyroid treatment was commenced on February 15, 1893. On March 1st some crusts had fallen off and the face looked better. April 13th, feeling of heat and tightness of face gone, most of the crusts have fallen off and the outlying nodules are less distinct. When the thyroid extract was discontinued for a few days the face grew redder. At the end of May she had a severe attack of facial erysipelas. After this the amount of scabbing was less but there was distinctly more infection. The thyroid treatment was continued for eleven months, with scarcely any intermission. The author remarks:

"The disease is not yet cured, but it is very greatly improved. There is,

I think, reason to hope that further treatment will produce further improvement; but whether in the course of time a cure will result it is impossible to say. The patient and her friends state that the face has never been anything like so well as it is now since the disease became severe five years ago. But it is only right to state that the vascularity of the face varies considerably from time to time."

The second case is that of a girl, aged eighteen years, in whom the disease began at ten years of age. The disease involved the *alæ nasi*, lips, and right eyelids. Thyroid treatment was commenced on December 13, 1893. Between December 23d and January 9th a decided improvement took place and had been maintained up to the present time. In the same article the author speculates on the possible efficacy of thyroid preparations in internal tuberculosis, leprosy, and cancer.—*British Med. Journal*, No. 1737.

THE DIAGNOSIS OF CALCULOUS ATROPHY OF THE PANCREAS.

LICHTHEIM (*Berliner klinische Wochenschrift*, 1894, No. 8, p. 185) has reported the case of a man, thirty-six years old, who at the age of twenty-two was suddenly seized with a severe attack of abdominal colic, attended with vomiting of greenish mucous material. The bowels were costive and the stools were said to have been black. There was fever, with sweating, and the patient kept in bed for six weeks. In the years that followed the man had successive attacks of similar character, though not of the same intensity, with intervals of freedom of several weeks' duration. At the age of twenty-eight the man was again seized with a severe attack of colic, compelling him to remain in bed for eleven weeks. Thereafter he continued in fairly good health, although constipation persisted. For a year he had suffered with diarrhœa, which had set in suddenly and had resisted the usual therapeutic measures. The stools were at first yellow, but gradually lost color. There was neither fever nor pain. With the persistence of the diarrhœa the appetite and, particularly, the thirst increased, but the patient nevertheless wasted rapidly. The weakness was marked, especially in the lower extremities. At times cramps occurred in the calves of the legs, and there was a sense of formication in the toes. Examination disclosed slight impairment of the percussion-resonance at the apices of both lungs, with harsh expiration and râles. Tubercle bacilli were at first not found in the sputum, but later their presence was demonstrable. Some four pints of urine were passed in the twenty-four hours, with a specific gravity of 1043 and containing an abundance of sugar; there was, however, no reaction to ferric chloride and none to tests for acetone. The quantity of sugar diminished notably upon the institution of a meat-diet, and ultimately all had disappeared. The liver and spleen displayed no physical alteration, and at no time had there been icterus. There was no history of alcoholism or syphilis. It was believed that the attacks of pain were due to the passage of pancreatic calculi, the presence of which had led to atrophy of the pancreas, with the development of diabetes; the diarrhœa was associated with the pancreatic lesion. The stools contained fat crystals, but no free fat even after the administration of fat with the food; tubercle bacilli were looked for, but not found. There was also no delay in the response of the urine to tests for salicylic acid after

the administration of salol. There was little change in the excretion of nitrogen in the urine. Despite assiduous treatment the general condition grew progressively worse, and death ensued. Upon post-mortem examination both lungs were found invaded by tuberculosis, while the pancreas was cirrhotic and its duct occluded by calculi. Microscopic examination disclosed an incrustation of the smallest pancreatic radicals with calcium salts. In the midst of the sclerotic tissue of the pancreas small areas of glandular structure could be everywhere seen.

A TUMOR OF THE OPTIC THALAMUS.

MASING (*St. Petersburger medicin. Wochenschrift*, 1893, No. 42, p. 377) has reported the case of a boy, fifteen years old, in whom tremor appeared intermittingly in the extremities of the right side, followed in a little while by weakness. In the course of a month headache set in, with, from time to time, vomiting and disturbance of speech, and subsequently diplopia. At about this time the boy had a right-sided convulsive seizure, with loss of consciousness, and it was on account of this that he presented himself. The entire right side of the body, including the face and the tongue, was paretic. There was no ataxia, and the muscle-sense was preserved. Sensibility was impaired upon the entire right side. The functions of bladder and rectum were preserved. The eyes were in a position of slight divergence. The diplopia involved the whole visual field. There was slight drooping of the left upper lid. The external ocular muscles supplied by the third nerve on either side were all paretic. The pupils were equal, of moderate size, but failed to react to light, although they contracted in convergence; the influence of accommodation could not be studied. There was no hemianopsia. In the absence of a cardiac lesion, and in view of the gradual development of the symptoms, a diagnosis of cerebral tumor was made; and on account of the age of the patient its nature was thought to be tuberculous, although the lungs presented no evidence of disease. Against the localization of the growth in the cortex or at the base was the wide distribution of the symptoms. Disease of the posterior portion of the left internal capsule would explain the hemidysæsthesia, the hemiparesis, and the paresis of the right side of the tongue, but not the unequal oculo-motor paresis; so that the left cerebral peduncle was concluded to be the seat of the neoplasm. In the course of a week some improvement took place. At the end of this time however, headache set in without obvious cause, and was followed by convulsions and coma, from which the patient did not emerge, death taking place a day later. Upon post-mortem examination the left optic thalamus appeared to be twice the size of the right, but it was found to be replaced by an ovoid tumor, about the size of a small apple, having a long diameter of 4 cm. and vertical and transverse diameters of 3 cm. each. The growth was surrounded by a delicate membranous capsule; it was bounded above and externally by the corpus striatum, posteriorly by the corpora quadrigemina, inferiorly by the left cerebral peduncle, and internally by the third ventricle. Its upper surface was irregularly nodular. On section it presented a grayish-brown color and a medullary consistence, and was traversed by numerous vessels and was the seat of several hemorrhages. Upon microscopic examination the tumor proved to be a sarcoma. Upon the floor of the aqueduct

of Sylvius, close to the line of division between the third and fourth ventricles, were also two small extravasations of blood about as large as pin-heads. The dura was tense, the longitudinal sinus empty, and the gyri flattened. All of the ventricles were distended with fluid. The boundary between the left optic thalamus and the striate body was displaced outward, upward, and forward. The right cerebral peduncle appeared to be normal; the left was flattened. The left corpora quadrigemina were displaced backward. The immediate cause of death seems to have been the condition of hydrocephalus. The oculo-motor palsy is to be ascribed to the hemorrhages on the floor of the aqueduct of Sylvius. The derangement of sensibility and motility upon the right side of the body are believed to be due to transmitted pressure upon the left internal capsule and cerebral peduncle. Though the pulvinar was profoundly involved, there was no hemianopsia.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE
UNIVERSITY AND GERMAN HOSPITALS;

ASSISTED BY

ALFRED C. WOOD, M.D.,

AND

C. L. LEONARD, M.D.,

INSTRUCTOR IN CLINICAL SURGERY, UNIVERSITY
OF PENNSYLVANIA; ASSISTANT SURGEON,
UNIVERSITY HOSPITAL.

ASSISTANT INSTRUCTOR IN CLINICAL SUR-
GERY IN THE UNIVERSITY OF
PENNSYLVANIA.

OBSTRUCTION OF THE INTESTINE FROM GALL-STONES; OPERATION; CURE.

KÖRTE describes (*Deutsche medicinische Wochenschrift*, 1894, No. 8) the following case: Man, aged fifty-two years, had suffered from frequent attacks of biliary colic, at which times a large number of stones passed. He became suddenly sick with severe pain in the lower left part of the abdomen, the bowels were obstructed, and vomiting and singultus supervened. On the fifth and sixth days of the illness the vomiting was fecal. On admission to the hospital the patient was somewhat collapsed, the abdomen tympanitic and tender to pressure. On the left side tense intestinal loops could be felt. The patient had received, first purgatives, then opium, pills of ice, and high rectal enemata, without influencing the condition.

Celiotomy was performed. The small intestine was found distended with gas and water, the peritoneum somewhat reddened and the glazing lost, and a few tablespoonfuls of bloody fluid in the pelvis. Upon examining the intestine a hard body was found twenty or thirty centimetres from the valve of Bauhin. As this could not be moved by pressure, the bowel was incised over the mass. The bowel was under great tension. The obstruction was found to be due to a soft, laminated stone as large as a medium-sized egg. The author thinks it had been free in the intestine for some time, and in

passing along was finally arrested by colic, when the symptoms of obstruction developed. The theory advanced by König, that small concretions might cause obstruction by invagination of the mucous membrane, and this being pushed forward by the stone, was not borne out by this case.

The diagnosis in these cases will always be obscure. It is rarely certain what the cause of the obstruction really is. Failure of expectant treatment, however, indicates operation. Of four cases of this kind operated upon by Körte, three have recovered.

SWEATING FEET AND FLAT FEET.

V. LESSER claims (*Deutsche med. Wochenschrift*, 1893, No. 44, p. 1070) that the condition of flat-foot depends upon the previous existence of the so-called sweating feet. In the spontaneous variety of the latter, beginning varicose changes of the cutaneous veins are always visible, although in many cases insignificant. This condition is most frequently observed at the age of puberty, but may also occur in childhood; it is sometimes inherited. On this condition depends the occurrence of flat-foot. It is most frequently seen in males, and when occurring in females usually develops at an earlier period. The nature of the occupation, as, for example, long-continued standing and the carrying of heavy loads, helps to develop this condition. Males tend to resist longer these influences than do females. In the so-called spontaneous flat-foot there is atrophy of the muscles of the leg and sole of the foot, and at the same time varicose changes in the muscle veins in greater or less degree. In the female sex the abnormal sweat-production usually ceases earlier than in the male, because in the former the development of varices under the influence of pregnancy is much more rapid, and brings about at an earlier period atrophic conditions of the skin. According to age, sex, and occupation, therefore, sweating feet or flat-feet occur either separately or together, the former being the earlier complaint of the two. The more marked development of the varices, besides the atrophy of the skin and the resulting consequences, as a solution of the epithelium and the formation of ulcers, belongs to later years.

THE USE OF ICHTHYOL SUPPOSITORIES IN THE TREATMENT OF PROSTATITIS.

FREUDENBERG reports (*Centralblatt für klinische Medizin*, 1893, No. 26) his experience with the use of ichthyol in from thirty to forty cases of prostatitis. The cases were almost exclusively of the chronic variety or in the late stage of the acute form. The preparation used was the sulphate of ammonium ichthyol, made into suppositories with cacao-butter. Some of the cases were gonorrhœal or post-gonorrhœal, and others were non-gonorrhœal.

In the acute stage, especially in gonorrhœal prostatitis, the author had no occasion to use ichthyol, inasmuch as he was quite satisfied with the result of the usual treatment for these cases.

Marked improvement was observed in the cases in a remarkably short time, and in nearly all cases complete cure of the existing symptoms followed. He uses the following formula: R. Ammon. sulpho-ichthyol., 0.3-0.6-0.75 grammes (5-10-12 grains); ol. theobrom., 2-2.5 grammes (30-45 grains). One

of these to be used in the morning after evacuation of the bowel and another in the evening, at bedtime, and a third only if there has been an evacuation during the day. In some cases he combined iodoform with the ichthyol and cacao-butter. The author concludes by the statement that in the treatment of prostatitis, at least in its chronic form, ichthyol is a valuable acquisition to the therapy of this disease.

The experiences of Scharff, Ehrmann, and Ullmann in the acute and gonorrhœal forms of prostatitis are quoted. These observers all report very satisfactory results.

Freudenberg advises against the employment of ichthyol in hollow suppositories, as when the former comes in contact with the rectal mucous membrane it might give rise to irritation.

FUNCTIONAL TROUBLE FOLLOWING OLD FRACTURES OF THE PATELLA.

AFTER a careful study of this subject, CHOUX (*Rev. de Chir.*, March 10, 1894) comes to the following conclusions:

I. The functional troubles consequent upon old fractures of the patella are either insufficient extension or flexion.

II. The difficulty in extension is due less to the atrophy of the triceps muscle than it is to the momentary physiological inability of the muscle to act efficiently upon the lower fragment of the patella.

III. The difficulty in flexion is dependent on the fibro-articular thickenings, which are themselves due to the retraction of the patella tendon and to the method of union between the fragments.

IV. Of the five modes of union, as generally divided, two types alone are capable of interfering with flexion; they are the short, but stiff, osseous or fibrous union and the fibrous union with two to five centimetres' separation of the fragments.

V. The prognosis in incomplete extension may be doubtful for several years, but restoration of function is generally the rule. Intra-osseous suture of the fragments is indicated in cases where the spontaneous re-establishment of function is not realized after a reasonable length of time.

VI. In regard to partial ankylosis resulting almost always from short, rigid union between the fragments, either osseous or fibrous, but increasing the length of the patella two or three centimetres. He considers the removal of one of the two fragments the only possible means of overcoming the functional difficulty, unless these types are transformed, as often happens, into types more favorable to flexion.

VII. The articular inflammatory thickenings, which often disappear, should be held under observation for from twelve to fourteen months, and are eminently fitted for the hydro-thermal treatment as used in the hospital of Bourbonne.

THE RELATION OF BEHRING'S THERAPEUTIC SERUM TO IMMUNIZATION FROM POISON.

BUCHNER (*Berl. klin. Wochenschr.*, 1894, No. 4) claims that his experiments enable him to deny the theories of Behring and to confute them experimentally. He objects to the method of their experimentation, and says that it

only shows that the animal was immune. His experiments showed that the poison (tetanus) and the antitoxin did not actually act on each other, but that they act separately upon the organism. The antagonism exists only in so far that the antitoxin makes the organism, the cells, and tissues able to resist the toxins—a true immunity. He finds substantiation for his results in the work of Centanni, Tizzoni, and Cantani.

The antitoxic serum must be of great power, according to Behring, to destroy the working of a small dose of specific poison.

Behring's explanation of the nature of the antitoxin as a product of reaction in the animal body is contradicted by Buchner, he believing that the antitoxin is a bacterial product—a changed toxalbumin.

CASE OF TUMOR OF THE SPINAL DURA MATER.

RANSOM and THOMPSON (*Brit. Med. Journ.*, February 24, 1894) report a case in which an extra-dural tumor was located in the region of the fifth dorsal vertebra. There was moderate, dull, aching, inconstant pain and was distinctly separated from the area of complete anæsthesia. There was complete paralysis preceded by a spastic condition. There was localized complete sensory loss and only slight and transient hyperæsthesia. The operation disclosed a tumor, bluish and lobulated, in the position of the extra-dural fat. It was readily separable from the dura and bones. The dura beneath it was markedly depressed. It measured about one and a half inches in length and *in situ* three-fourths inch broad.

Four vertebral laminæ were removed to expose the tumor, the canal being opened too low down at first. The wound was frequently irrigated with a 1:2000 perchloride of mercury solution and, just before closing, with iodized water. The growth was found to be a round-celled sarcoma. The patient's condition after the operation was not very good, and he died the third day after operation. The post-mortem showed that there had been no attempt at healing and the wound was in an unhealthy, septic condition. There was no involvement of the cord, though there were some slight signs of disorganization.

SUPRAPUBIC CYSTOTOMY.

SOUTHAM (*Brit. Med. Journ.*, January 13, 1894), in a clinical lecture, relates six cases of suprapubic cystotomy, of which four were performed for calculi, one for tumor of the bladder, and one for chronic cystitis accompanied by hæmaturia. Three of the stone operations were performed for hard stones in aged patients with greatly enlarged intra-vesical prostates. The author's reasons for preferring this method in these cases are: The difficulty of crushing and evacuating calculi from the pouch behind an enlarged prostate; the irritation and injury consequent upon the introduction and manipulation of the instruments; the hardness of the stones would necessitate a prolonged operation and be followed by shock, which was to be avoided in aged patients. Lateral lithotomy was precluded by the size and vascularity of the prostate. The fourth case, a boy, aged eleven, had a calculus one and one-fourth by seven-eighths inches. The suprapubic operation was used on account of the irritability of the urethra. The fifth case, a papilloma of the

bladder, was too large to remove *per urethram* in the female patient in whom it occurred. In the sixth, a chronic hemorrhagic cystitis, the suprapubic operation gave a chance to inspect the bladder, and a diverticulum that could not be felt was seen, ulcers touched with caustic, the bladder drained, and the patient made a good recovery.

ENTERO-VESICAL FISTULA TREATED BY LAPARO-ENTERECTOMY.

AN interesting and rare case of entero-vesical fistula is reported by HEUSTON (*Brit. Med. Journ.*, February 24, 1894). The patient, a stout, full-blooded man of thirty-six, had two attacks of influenza, and apparently never fully recovered his strength. A year afterward he noticed that portions of feces and gas were passed *per urethram*. Examination with a sound disclosed nothing; milk injections into the bladder did not show in the stools, but an injection *per rectum* of sodium salicylate, and the urine tested a few minutes later by perchloride of iron, showed a relatively large quantity of sodium salicylate in the urine.

A laparotomy was performed; a fistula the size of a pea found; the bladder wound closed; and the intestine, which contained a cylindrical neoplasm, resected. This growth proved to be, under the microscope, a columnar epithelioma. The patient rallied well, but died with all the symptoms of collapse on the fourth day. The autopsy showed peritonitis to be absent and that the operation had been successful.

A CASE OF PSEUDARTHROSIS OF THE UPPER ARM.

IN speaking of the methods of treatment in such cases, v. EISELBERG calls special attention to the Gussenbauer clamp, which he considers a simple and efficient method of holding the bones firmly in position. Many complicated methods have been recommended, and in late years methods by Bircher, Wille, Dollinger, Senn, and Cholot. The author considers this method superior to all the others on account of its simplicity and ease of application. The clamp consists of a bar having two prongs perpendicular to it at either end; they are sharp and three-sided.

Two small incisions are made down to the bone, one above and the other below the seat of fracture, and the clamp is driven into place while the ends of the bone are held closely in contact. Five or six sizes should be kept on hand. They have been used with great satisfaction for years in Billroth's clinic. The absolute fixation that is given by the use of this clamp insures a sufficient blood-supply to the lower fragment by giving absolute rest, and the lesser interference of the small points of the clamp than is found in the use of an ivory pin.

A LARGE CEREBRAL TUMOR WITHOUT HEADACHE AND WITH NORMAL EYE-GROUND.

PEL (*Berlin. klin. Wochenschrift*, 1894, No. 5) reports an interesting case of a cerebral tumor. The primary symptoms of paræsthesia of the fingers in the right hand were followed by paralysis, which extended over the hand and forearm. Not until a year later did paralysis of the right leg follow,

accompanied by enfeebled intelligence and memory, with difficulty in thinking and perverted disposition. A month later there were epileptiform seizures, with a disturbance of speech that followed and remained. There was, however, no headache, abnormal condition of the eye-grounds, dizziness, nausea, or vomiting. Only in the last few days did the patient complain of headache when questioned.

Thus there were absent symptoms that have been insisted upon by all authors as pathognomonic of brain tumors. The slow development of the symptoms and the spread of the paralysis, and the involvement of the so-called psycho-motor centres, showed the location of the tumor, and as internal medication was of no avail, operation was decided upon. The operation disclosed a large chestnut-shaped tumor in the motor area, which involved the pia mater only in one point. The tumor was easily removed, as it was encapsulated and did not involve the brain cortex. The tumor was soft and pressed into the brain substance. It was about two and one-eighth inches long, one and three-quarter inches wide, and one inch thick. It was a cystic fibroma. The patient died shortly after the operation, of heart failure. The case illustrates the possibility of the presence of a cerebral tumor in cases where some of the symptoms that are considered characteristic are absent.

OTOLOGY.

UNDER THE CHARGE OF

CHARLES H. BURNETT, A.M., M.D.,

AURAL SURGEON, PRESBYTERIAN HOSPITAL, ETC., PHILADELPHIA.

TRANS-ILLUMINATION OF THE MASTOID CELLS.

DR. GEORGE W. CALDWELL, in the *New York Medical Journal*, vol. lviii., No. 3, considers the subject of the trans-illumination of the mastoid cells as a means of diagnosis of mastoiditis interna suppurativa. In view of the importance of determining, before any operation is performed upon the mastoid, whether or not there is any pus within this cavity, he suggests that a method of trans-illumination of these cells by means of a miniature electric lamp, and the conclusions to be deduced therefrom based upon the fact of the diaphanous nature of healthy mastoid cells and the opacity of the pus, will greatly aid the surgeon. He then describes an apparatus devised for this purpose. The apparatus required is a battery which will develop about ten volts, regulated to light well, but not to burn out a two- or three-candle power electric lamp of very small calibre. This is protected by a thin rubber tubing, fenestrated at one end, and made to fit snugly at the meatus by a washer of larger tubing. In a perfectly dark room the small electric lamp is inserted well into the external auditory meatus. He says: "Instantly the healthy mastoid is illuminated with a ruddy glow, extending from the apex to the lateral sinus and to the limits of the cells above. The reverse manner may

be more satisfactory in a given case, as when the canal is more obstructed and painful, and a larger lamp may be used. A speculum of large size being placed as for examination of the membrana tympani, the electric lamp encased in a rubber tubing projecting slightly beyond the limit is pressed against the mastoid and a current made, when the external auditory canal and middle ear will be filled with rosy light from the posterior wall. By placing the lamp on different portions of the mastoid the limitations of the cells and the position of the lateral (?) sinus may be accurately mapped out and the particular region in which a pathological process exists demonstrated. If the cells are occupied by a purulent collection the glow will be absent and the cells will be dark. Comparison with the opposite healthy side renders the diagnosis of pus in the mastoid cell complete, whether or not the usual symptoms are present, for suppurative mastoiditis may exist without external indications, which, indeed, is the most dangerous form, as the process tends to extend inward, not outward."

The writer claims that the method which he thus submits is scientifically accurate, easy of application, painless, strikingly pictorial, instantly decisive, and demonstrative to the patient's friends.

THE SURGICAL PATHOLOGY OF THE MASTOID PROCESS.

DR. J. E. SHEPPARD, of Brooklyn, in the *Brooklyn Medical Journal*, vol. vi., Nos. 4 and 5, contributes a carefully written article on this important subject. The anatomy, primary mastoid periostitis, secondary mastoid periostitis, inflammation of the mastoid cells, sclerosis, condensing otitis, with symptoms and diagnosis of acute inflammation of the mastoid cells, and the prognosis are given with great completeness. Cerebral complications, such as meningitis, brain abscess, extra-dural abscess, diseases of the sinuses with phlebitis, thrombosis, and pyæmia, are also duly considered. Cholesteatoma, too, one of the most interesting conditions found in the ear, is considered. New growths in the lymphatic glands over the mastoid, fibrous polypi, and simple polypoid granulations, which may arise in the mastoid process and project through carious defects into the mastoid cortex behind the auricle, are also alluded to. Epithelioma and sarcoma are also mentioned. The indications for the operation are those so well known as not to demand a lengthy mention in this review.

The operation upon the mastoid is carried out with well-known antiseptic precautions. The article concludes with a consideration of Stacke's and Schwartze's operation on the mastoid for a maintenance of a communication between the antrum and the outer ear.

CHOLESTEATOMA OF THE EAR.

DR. HARRY FRIEDENWALD, of Baltimore, Md., under the above title gives a very interesting account of several cases of this disease. With quite a long consideration of the subject, it says that it is important to remember that there is a tendency for cholesteatoma or cholesteatomatous masses to recur. Patients are therefore to be examined at intervals of a few months for a long time after their apparent cure.

The treatment consists chiefly in the thorough removal of the cholestea-

tomatous masses, and complete antiseptic cleansing of the drum-cavity by the ordinary well-known means.—*Medical News*, vol. lxii., No. 10.

COUNTER-IRRITANT EFFECTS OF THE USUAL MASTOID OPERATION.

DR. ALBERT H. BUCK, of New York, maintains that in certain cases the good effects of the operation on the mastoid are not confined to the benefits directly attributable to good drainage and thorough cleansing of the parts, but that the derivative or counter-irritant influence of the operation plays a very important part in effecting a cure in these cases. As setons and issues were once looked upon as valuable therapeutic agents, so an operation upon the mastoid process may be regarded as "an issue on a comparatively large scale."—*Medical Record*, New York, vol. xlv., No. 5.

[This undoubtedly is true, but it is difficult to understand how such irritation can have any beneficial influence over those cases of more or less active intra-cranial inflammation set up by a disease of the ear, or that they could have sufficient counter-irritant power to turn the scale from a fatal to a favorable issue, as the author believes to have been the result, as shown in the histories of three cases which he gives. Intra-cranial irritation might be thus relieved, but intra-cranial inflammation is not likely to show itself amenable to this form of treatment. Judging from the notes of the cases, they may be regarded as simple cases of general systemic and cerebral irritation and not intra-cranial inflammation.—REV.]

OPHTHALMOLOGY.

UNDER THE CHARGE OF

GEORGE A. BERRY, M.B., F.R.C.S. EDIN.,

OPHTHALMIC SURGEON, EDINBURGH ROYAL INFIRMARY;

AND

EDWARD JACKSON, A.M., M.D.,

PROFESSOR OF DISEASES OF THE EYE IN THE PHILADELPHIA POLYCLINIC; SURGEON TO WILLS EYE HOSPITAL, ETC.

BLINDING BY DIRECT SUNLIGHT.

GEORGE MACKAY (*Ophthalmic Review*, vol. xiii., Nos. 147-149) publishes a very complete study of this subject, made with special reference to prognosis, reporting seven cases of his own and quoting previously reported cases. The affection follows too prolonged looking at the sun, and cases are apt to appear shortly after the occurrence of an eclipse.

There is no record of any microscopic study of the lesions in man. But experimentally produced on the eyes of the lower animals, they include an extension of the pigment-laden processes of the hexagonal epithelial cells between the rods and cones, with alterations of these latter structures. Later

there is exudation into the affected tissue, and finally a cicatricial formation of pigmentary connective tissue in the outer part of the retina, with atrophic changes in the neighboring choroid. Shutting off the invisible heat-rays does not prevent the injury.

The normal after-image succeeding a brief glance at the sun undergoes changes of color lasting for a few seconds, or at most a few minutes, and is followed by prompt recovery. The persistence and reappearance on closing of the eye of an after-image, which does not rapidly undergo alteration in color, may be taken as evidence that the retinal stimulation has passed the physiological limit. Later, often after some hours, it is noticed that there is a positive central scotoma in the field of the injured eye. An unfortunate characteristic of the affection is that this is apt to be the eye which has been previously the better.

The scotoma is usually quite small, occupying less than an area twenty millimetres in diameter of the field measured at a distance of one metre. The ophthalmoscopic changes are very slight and scarcely characteristic, the region affected being usually included within the fovea. During the first week there may be slight loss of light reflex at the fovea. During the second week a tendency toward increasing pigmentation or obscure signs of exudation may be noticed. Later the fundus may appear quite normal. Sometimes reddening of the optic disk and dilatation of the retinal vessels have been noted. The sensations noticed by the patient in addition to the scotoma, include a "revolving movement" or "oscillation," giving a tremulousness to the object looked at, which may be an early and very persistent symptom; and metamorphopsia from displacement of the retinal elements, which may be permanent. It is possible to have full or nearly full acuteness of vision retained, although permanent damage has occurred, because the affected area is so small as to allow good, apparently central vision alongside of it.

The prognosis must depend on the time which has elapsed since the accident; the degree of impairment of visual acuteness for test-type and for colors; the extent of the scotoma, and especially of the absolute area contained within it; the gravity of the ophthalmoscopic changes; the presence or absence of oscillating movement, or metamorphopsia; and the local and general healthiness of the subject. Taking this into account, and supposing the eye to have possessed normal vision, Mackay roughly divides the cases into four classes: 1. A patient with vision = $1/3$ or better in the first week (and the earlier the better), has a good chance of practical recovery in one month. 2. A patient with V. = $1/3$ in the second week, has a fair chance of practical recovery in three or four months. 3. A patient with V. = $1/3$ in the third week, will probably recover slowly in five or six months, but the chances are rather against his complete restoration. 4. A patient with vision which is poorer than $1/3$ at any time, though he may make rapid progress in the first month, seems to have a bad chance of recovering V. = $6/6$. Hitherto no case with vision poorer than $1/3$ has regained $6/6$. By "practical recovery," is meant cessation of obtrusive defect.

The treatment should be preventive—the use of sufficiently dark glasses or other device to exclude the greater part of the light from the eye when the sun is to be directly observed. For this purpose the glass must be at least

so dark that no object illuminated by diffused daylight is visible through it. When the injury has occurred, protection of the eyes from great alterations of light, rest from eye-work during the first month, and attention to the general health are indicated. The use of strychnine hypodermatically or galvanism seems to have little support from theory or experience.

TUMORS OF THE OPTIC NERVE.

BRAUNSCHWEIG (*Von Graefes Archiv*, vol. xxxiv. 4) reports a series of four cases. The most characteristic symptoms are blindness and progressive exophthalmos. Ocular movements remain good; the ophthalmoscope shows neuritis or atrophy; pain and tenderness on pressure are usually absent. The tumors may sometimes be made out on palpation. The treatment is removal, the operation preferred being through the temple with an incision from the upper outer margin of the orbit to the zygoma down to the periorbital, which is raised, and the outer wall of the orbit removed. By this operation the nerve can be examined and removed as far back as the optic foramen, with the least possible danger to the eyeball and the tissues surrounding it. Recurrence of these tumors is infrequent. They are usually classed as myxosarcoma. Braunschweig's patients were otherwise healthy; three of them males and one female, aged from eighteen months to twenty-four years.

OBSTETRICS.

UNDER THE CHARGE OF

EDWARD P. DAVIS, A.M., M.D.,

PROFESSOR OF OBSTETRICS AND DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC;

CLINICAL PROFESSOR OF DISEASES OF CHILDREN IN THE WOMAN'S MEDICAL COLLEGE;

CLINICAL LECTURER ON OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE;

VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.;

ASSISTED BY

WILLIAM H. WELLS, M.D.,

ASSISTANT DEMONSTRATOR OF CLINICAL OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE,

PHILADELPHIA; CLINICAL ASSISTANT TO THE CHAIR OF OBSTETRICS AND

DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC.

THE DANGER OF INTRA-UTERINE INJECTIONS OF GLYCERIN FOR THE PRODUCTION OF ABORTION.

PFANNENSTIEL in the *Centralblatt für Gynäkologie*, 1894, No. 4, relates his experiences with intra-uterine injections of glycerin for the production of premature labor. He states that when this procedure was first published he admired its boldness, and concluded that the dangers of it were but occasional. His later experience in two cases, the histories of which he gives, has led him to a change of opinion regarding the above method. In the first case, labor was induced on account of advanced albuminuria, after the usual therapeutic means had been tried. Following consultation with his colleague,

Wilke, the author, under all aseptic precautions, injected 100 cms. of chemically pure glycerin between the foetal membranes and uterine wall. In a short time the patient showed symptoms of profound collapse, which, notwithstanding all means of restoration, ended fatally in a few hours, the patient dying undelivered. The autopsy showed death to have been due to nephritis.

In the second case, induction of labor had been attempted by bougies four weeks before term on account of rhachitic pelvis combined with stenosis of the os uteri and cervix. The bougies not having the desired result, after consultation 100 cms. of concentrated glycerin were injected. One hour afterward the patient suddenly became cyanotic, and the temperature, which had been 39°, fell to 37° C., rising again to normal.

The urine drawn off by catheter an hour after the injection showed blood, albumin, and casts, and spectroscopic examination demonstrated methæmoglobin with hæmoglobin. In twenty-four hours these abnormal constituents gradually disappeared. The glycerin failed to excite uterine contractions, but a small living child was delivered later by other means. The mother recovered.

The author believes the glycerin in the above cases caused decomposition of the blood, and he agrees with Afanassiew, who found that in dogs glycerin produced hæmoglobinuria, glomerulo-nephritis, and even interstitial nephritis; Although in the first case nephritis undoubtedly existed, it is his opinion that the glycerin injection hastened the fatal termination.

THE INFLUENCE OF CORNUTIN AND ERGOTIN UPON THE COURSE OF LABOR.

KROHL (*Archiv für Gynäkologie*, Band xlv., Heft 1) discusses at length the effects of preparations of ergot upon the uterus during and after labor. He finds that the uterus is favorably influenced by both ergotin and cornutin, but particularly the latter; the diminution in the size of the uterus caused by these agents being most noticeable in the first three days of the puerperal period. In labors, when ergotin or cornutin have been employed, there is apt to occur an expulsion of clots of coagulated blood at an earlier period than when no medicament has been used; and it has also been found that the internal os uteri closes much sooner; this rapid closure being particularly noticeable after the exhibition of cornutin.

The lochia alba is found to appear sooner when cornutin is used than without this means. The pulse undergoes some slowing during the administration of ergotin and cornutin, but no temperature change was noticed, nor was the secretion of milk influenced in any way. These agents distinctly favor uterine involution and diminish considerably the congestion of that organ following labor; besides this, they prevent the collection of great masses of blood in the puerperal uterus, thus preventing decomposition.

As the whole inner surface of the uterus after birth presents a great irregular wound, these remedies by compression prevent the absorption of wound secretions through the lymph spaces. The author does not recommend the employment of ergot in substance, because of its uncertainty of action, but holds in high regard cornutin, or cornutin containing ergotin. Of these

preparations Bombel's ergotin is particularly to be commended, although he fears the very considerable cost will prevent the extensive use of this preparation.

In concluding his article, the author sums up the indications and contraindications for the use of ergotin, as follows :

It is indicated :

1. In all obstetric operations, and especially shortly before Cæsarean section.
2. In atony of the uterus.
3. After manual deliverance of the placenta, and after abortion and macerated fœtus.
4. In cases of twin labor, when atony of the uterus is threatened in consequence of the sudden evacuation of the overdistended uterus.
5. In the puerperal period, in subinvolution of the uterus and in recurring sanguineous lochia.
6. In puerperal endometritis combined with vaginal inflammation, and particularly after vaginal irrigation.

It is contraindicated in :

1. Hemorrhage during pregnancy.
2. In cases of weak pains in the period of dilatation and expulsion. It is particularly contraindicated in the latter when combined with contracted pelves. In cases of tumors filling the small pelves or the soft parts of the birth canal. In tetanus uteri and when stricture of the os uteri exists.

TUBERCULOSIS AND UNCONTROLLABLE VOMITING CONSIDERED AS INDICATIONS FOR ABORTION.

GUENSBURGUE (*Archives de Tocologie et de Gynécologie*, March, 1894): A somewhat extensive research made by the author seems to disprove the oft-repeated assertion that pregnancy delays the progress of phthisis, and rather establishes the reverse. Lebert reports 7 cases in whom the malady had lasted from four to ten months; 2 succumbed ten to eleven days after accouchement; the 5th from five to ten weeks after labor. Of 25 cases of tubercle in pregnant women the malady terminated in death in 3, three months after accouchement; 5 cases six months after; 11 before the end of the first year, or 76 per cent. during the first year. In young girls cured of a tuberculous affection before their marriage, the children of their first pregnancies die soon after birth or are scrofulous or tuberculous. The same view is held by Müller, who adds that in tuberculous women the accouchement is complicated by uterine feebleness and hemorrhage. Lactation seems even more injurious than pregnancy to the tubercular. The author believes in such cases the interruption of pregnancy is followed by good results, and is of the opinion that curettage with strict antisepsis seems less of a risk to a tuberculous woman than to allow the pregnancy to run its course. The causes of uncontrollable vomiting are multiple. Most frequently they may be attributed to a pathological condition of the uterus. Readjustment of uterine deviations or cure of uterine inflammations may succeed, but frequently these deviations are of little importance. If the patient can retain no nourishment and is rapidly failing, there remains no means but to induce

labor while the general condition is still fairly good. The statistics of fatal cases of incoercible vomiting are frightful; out of 309 cases the mortality is 55 per cent. Even at an epoch anterior to antisepsis, abortion when produced gave more favorable results than anticipated; but now that antisepsis is practised, it is our duty to provoke premature expulsion as soon as the patient's condition permits. With a multipara curettage may be used, with prompt dilatation. In primiparæ dilatation with prepared sponges or laminaria dilators.

OBSERVATIONS UPON 95 CASES TERMINATED BY THE FORCEPS.

GUENSBURGUE (*Archives de Tocologie de Gynécologie*, 1894, No. 3) reviews the statistics of Huggenberger, Johnson of Dublin, and others, and records his own observations made on 95 cases of forceps delivery, the indications being as given below:

	Times.
1. Exhaustion of the nervous system without uterine feebleness	9
2. Irregularities in foetal heart beat	9
3. Pelvic contraction, prolonged compression of maternal soft parts and atony	10
4. To avoid mortification of soft tissues of pelvis	25
5. To avoid tears of vagina	4
6. On account of eclampsia and epilepsy	7
7. On account of pendulous abdomen	2
8. Face presentation (once after podalic version)	2
9. For metrorrhagia from uterine fibro-myoma	2
10. For tetanus of the uterus due to abuse of ergot	1
11. For atony of the uterus in primiparæ	24

The results of his operations have been as follows:

For the mother—

	Per cent.
1. Mortality	0
2. Afebrile post-partum (in some 69)	72.6
3. Morbidity of light and short duration (20 cases).	21
4. Morbidity of grave outlook (6 cases)	6.3

To infant—

Of 95 infants extracted with forceps, 17 could not be resuscitated, 17.6 per cent.; but if we exclude infants giving no signs of life before intervention, the number falls to 6. In the last 6 cases the death of the child has been caused four times by the difficulty of extraction of the shoulders, and twice by compression of cord. Thus the forceps has occasioned the death of two children, or about 2 per cent.

Episiotomy. This operation was performed 16 times on both sides and twice on one side. The incision extended itself considerably in 2 cases, and but slightly in 6.

Perineal suture in all cases of rupture has given 18 cases with incomplete union, and in 2 cases it has failed from considerable œdema of the parts.

Slipping of the forceps occurred 9 times. The author generally employs the instrument of Lasarewitch.

Of 38 women, 13 had puerperal maladies, 34.2 per cent, in place of 27.3 per cent. of general morbidity in all his cases. 8 women had metrorrhagia

The infantile mortality has been also increased 41.3 per cent. instead of 17.6 per cent.

Complete anæsthesia was employed in 11 cases; of these 4 had uterine inertia and hemorrhage at the moment of delivery, obliging artificial extraction of placenta. Chloral hydrate sometimes gives similar results.

SYMPHYSIOTOMY.

TOUJARI (*Annales de Gynécologie et d'Obstétrique*, March, 1894) reports a case of symphysiotomy with favorable results for mother and child. The patient, a rachitic orange peddler, aged twenty-eight years, had right scolio-kypnosis in the dorso-lumbar region, with general contraction of the pelvis. The patient's first labor had been terminated by basiotripsy, delivery by forceps being impossible. In the eighth month of the present pregnancy the foetus presented by the breech, but subsequently changed spontaneously to a vertex presentation. After fifty hours of vain uterine effort, symphysiotomy was performed in surroundings most unfavorable to the patient's recovery. A space of 25 mm. was obtained after section of the pubic joint and delivery was effected by means of forceps, the uterus assisting vigorously. Recovery was prompt and complete. The child, although somewhat asphyxiated, was quickly resuscitated. The pubic bones were united by two bony sutures of catgut. Five months after operation a measurement of the pelvis gave the following:

Height of pubic symphysis	45 millimetres.
Promonto-pubic diameter	7.5 centimetres.
Coccy-pubic diameter	9 "
Bi-ischiatic diameter	8 "
Bi-ischiatic diameter	9 "

DYSTOCIA CAUSED BY EXTRAORDINARY DEVELOPMENT OF THE FŒTAL BLADDER.

WALTHER (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxvii., Heft 2): The case occurred in the clinic of Prof. Löhlein, the mother being a II-para, having had one child by a normal labor. There was no albuminuria or specific history. Up to the time of pregnancy menstruation had been regular. In this her second labor the child presented by the feet, and great difficulty was encountered in extraction, although the soft parts were well dilated. There was but a small amount of liquor amnii, but examination was followed by an amount of amber-colored fluid, after which a dead macerated female foetus was extracted. The maternal patient recovered and left the hospital at the end of ten days.

On examination of the body of the foetus it was found that the cause of the dystocia lay in a great dilatation of the bladder, with excentric hypertrophy of its walls, with ascites. Both lungs were in a state of atelectasis. Pericardium showed an old inflammation. Liver and kidneys were enlarged, the left kidney being the seat of beginning cystic degeneration. Ureters were dilated. The following pathological changes were also present: Deficient development of anus and rectum, the latter having a small fistulous

connection with the bladder. Incomplete atresia of the urethra, especially at its central portion. The outer and internal genital organs showed imperfect development, the position of the vagina being abnormal, and there being complete absence of the cervix and of the middle portion of the corpus uteri, through lack of union of Müller's ducts (uterus bipartitus). Traces of an old peritonitis were to be seen in company with the subsequent adhesions of the abdominal organs and the formation of ascites.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

THE ULTIMATE TERMINATIONS OF NERVES IN THE FEMALE GENITAL ORGANS.

GAWRONSKY (*Centralblatt für Gynäkologie*, 1894, No. 11) summarizes the result of his microscopical studies as follows: There are two sets of nerve fibres in the uterus, one set being distributed throughout the muscular layer without anastomosing, and terminating in multipolar ganglion cells in the submucosa; from these cells spring numerous filaments which enter the mucosa, and terminate either in the epithelial cells or in terminal bulbs. Another set, which also traverse the muscular layers, end directly in the epithelial cells and glands. In the Fallopian tube the nerve fibres interlace freely and give off numerous twigs which terminate in points or bulbs just beneath the epithelial layer. Bundles of nerves can be demonstrated in the parenchymatous zone of the ovary, which do not communicate with one another. In some preparations delicate branches can be traced to the follicles, where they either end directly in the theca folliculi, or enter the latter after a more or less circuitous course. Fibres are frequently seen which end in terminal bulbs in the membrana granulosa. Occasionally fibrils can be traced through the granulosa to the immediate vicinity of the ovum, though it is impossible to establish their ultimate termination.

The nerves in the muscular coat of the vagina present numerous sharp bends; at these points lateral branches are given off which take the same course as in the muscular layer of the uterus. After they enter the submucosa the fibres change their direction, form flexures, and reach the epithelial surface. They terminate in points or bulbs in the deeper layer of epithelium.

PRURITUS VULVÆ.

SCHULTZE (*Centralblatt für Gynäkologie*, 1894, No. 12) calls attention to the fact that pruritus is often directly due to the condition of the endometrium. He has repeatedly demonstrated the fact that the irritation of the vulva may

be aggravated by simply passing a sound into the uterus; in fact, sometimes there seems to be a definite limited area of the endometrium, irritation of which gives rise to reflex pruritus. When pruritus and purulent endometritis coexist, the causal relation between the two is sufficiently clear, but it can be demonstrated even when the latter condition is absent. In every obscure case the presence of endometritis should be sought for. According to the writer's observation the majority of patients with obstinate pruritus do not masturbate, and *vice versa*.

THE EXTRA-MEDIAN INCISION IN CÆLIOTOMY.

FLATAU (*ibid.*) makes his primary incision through the muscle instead of in the median line, and has had no ventral hernia in an experience extending over two years and a half. He cuts through the skin about half an inch to the left of the linea alba and separates the muscular fibres, mainly by blunt dissection, compressing bleeding vessels temporarily, so that the wound is dry when the peritoneum is incised. He disapproves of Abel's plan of cleansing the wound with an antiseptic solution. Silkworm-gut sutures are passed through all the layers of the abdominal wall, including as little as possible of the skin and more of the muscle and peritoneum.

LIGATION OF THE UTERINE ARTERIES IN FIBRO-MYOMA.

RYDYGIER (*Centralblatt für Gynäkologie*, 1894, No. 13) thinks that it is not sufficient to tie the uterine arteries alone in order to arrest the growth of uterine fibroids and to check hemorrhage; the ovarian arteries should also be ligated, on account of their free communication with the uterine. The latter may be secured per vaginam, and the former after opening the abdomen, in cases in which there are numerous adhesions, although in general it is better to tie both from above. The cases in which ligation is indicated are those of interstitial tumors of moderate size, and in which the patient has become so exhausted by repeated hemorrhages that she could not endure a radical operation.

THE OPERATIVE TREATMENT OF FIBRO-MYOMA.

LAURO (*Riforma Med.*, 1893, No. 9) reports three successful cases of supra-vaginal amputation, in which the stump was secured with a rubber cord and was dropped back. In each instance the elastic ligature came away through the cervical canal at the end of several weeks.

ZWEIFEL (*Centralblatt für Gynäkologie*, 1894, No. 14) describes at length his method of treating the stump in hysteromyomectomy, which he believes is superior to all that have been devised. After ligating and dividing the upper portions of the broad ligament, the usual peritoneal flaps are dissected from the uterus. The cervix is then ligated in sections, and the mass is excised without much loss of blood. Finally, the stump is covered with peritoneum by suturing the anterior and posterior flaps. The cervical canal receives no special treatment, with the view of destroying septic germs, except in the case of sloughing tumors. Occasionally, if hemorrhage is feared, a temporary elastic ligature is applied, which is removed after the

stump has been ligated. The writer's mortality in 92 cases thus treated was only 3.2 per cent. The comparative mortality by different methods in the hands of various operators he estimates as follows: The method adopted by Schroeder, Martin, Leopold, and others, 25.6 per cent.; the use of the elastic ligature, as practised by Olshausen, Fritsch et al., 24 per cent.; ligation and extra-peritoneal treatment of the stump, 5.2 per cent.

THROMBOSIS FOLLOWING COELIOTOMY IN TRENDLENBURG'S POSTURE.

V. STRAUCH (*ibid.*) reports three cases of thrombosis of the veins of the lower extremities (always the left) in nineteen coeliotomies performed with the patient in Trendelenburg's posture, ether being the anæsthetic employed. He attributes this complication to "the specific effect of the ether plus the elevated position," and is resolved in the future to keep the legs of the patient extended.

[The writer's deductions are based on such imperfect data that they are comparatively valueless. Considering the thousands of abdominal sections which have now been performed in this way without similar results, it is only fair to infer that the cause of the thrombosis should have been sought for within the pelvis, and should not have been attributed either to Trendelenburg's posture or to the anæsthetic.—ED.]

THE TREATMENT OF FIBRO-MYOMA WITH CHLORIDE OF ZINC.

CONDAMIN (*Lyon Med.*, May 28, 1893) has adopted successfully the following course of treatment in the case of fibroids which give rise to no symptoms except leucorrhœa and moderate hemorrhage: Pencils of chloride of zinc (50 to 33 per cent.) are introduced into the uterine cavity after previous dilatation and irrigation. The cervix is then tamponed with gauze, and the patient lies on her stomach for three or four hours afterward, being kept in bed for eight or ten days. The sloughs separate on the tenth or twelfth day. The patient has considerable pain and a temporary elevation of temperature. The writer reports twenty cases in which the most satisfactory results followed the treatment.

THE ASSOCIATION OF CARCINOMA AND FIBRO-MYOMA.

GENER (*Centralblatt für Gynäkologie*, 1894, No. 14) analyzes forty-six cases collected from the literature, which he divides into three classes, viz.: Those in which there is primary cancerous degeneration of the myoma; those in which the two exist simultaneously in the corpus uteri; and cases in which myoma of the body is complicated with cancer of the cervix or portio. Ten cases are described as belonging to the first class, but only four are to be regarded as authentic; while there are twenty-three of the second, and twelve of the third.

The writer does not believe that the presence of the myoma bears any direct causal relation to the development of the carcinoma. The diagnosis of myoma of the body complicated with carcinoma of the cervix is easy; in the case of a pre-existing myoma which gives rise to aggravated symptoms at the time of the climacteric, such as pain, hemorrhage, foul discharge, and

rapid decline in health, the suspicion will be awakened that cancer has also developed, but the diagnosis can only be confirmed by curettage.

Extirpation is the only proper surgical treatment. If the uterine tumor does not exceed a child's head (!) it may be removed per vaginam, otherwise by cœliotomy, due care being exercised to prevent infection of the peritoneum by contact with discharges from the cervix, by tamponing the canal with gauze and closing the os with sutures.

CARCINOMA OF BARTHOLIN'S GLAND.

SCHWEITZER (*Archiv für Gynäkologie*, Bd. xlv., Heft 2) reports the case of a woman aged fifty-eight years, who presented a primary cancerous growth the size of a pigeon's egg on the right labium, at the site of Bartholin's gland; the entrance of the duct could be demonstrated on its surface. The inguinal glands were enlarged. Three years later the tumor had increased to the size of a hen's egg, when it was excised, but there was a rapid recurrence in the inguinal glands. The diagnosis was confirmed by the microscopical examination. Primary carcinoma in this region is exceedingly rare, and has not been previously described at any length.

PÆDIATRICS.

UNDER THE CHARGE OF

LOUIS STARR, M.D.,

OF PHILADELPHIA;

ASSISTED BY

THOMPSON S. WESTCOTT, M.D.,

OF PHILADELPHIA.

PULMONARY INFLAMMATIONS IN YOUNG CHILDREN.

N. MILLER, of Moscow (*Jahrbuch f. Kinderheilkunde*, Bd. xxxvii., Heft 2, January, 1894, p. 113), has made an extensive study under this title, from material gathered in the Moskauer Findelhaus, and concludes with the following general propositions:

1. Pneumonia among these foundlings is very common, giving rise to one-third of the total mortality in this hospital.

2. The causes of the frequency of this disease are numerous, being attributable partly to anatomical and physiological peculiarities of the respiratory organs at this time of life; partly to various prejudicial influences, climatic, telluric, hygienic, and hereditary in character, to which these children are exposed, both without and within the institution.

3. Congenital pneumonias were seldom observed, and the diagnosis during life was almost impossible; they are septic or syphilitic. The former are

very often lobar and diffuse, and end fatally in the stage of red hepatization; the latter may appear in different anatomical forms: pneumonia gelatinosa, alba, gummosa, interstitialis fibrosa; but generally congenital syphilitic pneumonias are rarely encountered at birth among those inheriting the syphilitic taint.

4. Acquired pneumonias in such children are either primary or secondary complicating other diseases. The latter are twice as frequent as the former. Broncho-pneumonia, in lobular or lobular-confluent form, similar to the catarrhal pneumonia of adults, is the most frequent primary, as well as secondary, form of inflammation. Much less frequent is the pure lobar pneumonia.

5. Primary pneumonias far oftener than secondary are apt to be purely lobar or croupous in nature; for the most part they are unilateral, and more frequently right-sided. Complicating pleuritis, which is not infrequent, is usually fibrinous, very seldom purulent.

6. Secondary pneumonias are very seldom lobar from the start; usually they are lobular and confluent, becoming lobar by extension, like the catarrhal pneumonia of adults. For the most part they are double; and when, rarely, they are unilateral the right lung is more frequently affected.

7. Primary pneumonia relatively seldom is associated with congenital atelectasis; very often, but not always, it develops from a bronchitis, laryngo-tracheitis, or grippe. The secondary broncho-pneumonias often originate from a hypostasis or in the train of acquired congestive atelectasis.

8. The acquired septic pneumonias are often interstitial, double, and complicated with purulent pleurisy.

9. The so-called cerebral pneumonias, from complicating meningitis, are very seldom observed in these children, as is also the hemorrhagic form of pneumonia; the former complicating quite exclusively the primary lobar form, the latter found relatively often with secondary broncho-pneumonia.

10. As terminations of pneumonia in very young children, rarely observed, were abscess, gangrene, and chronic inflammations; cheesy and tuberculous forms resulting in large cavities and cheesy degeneration of bronchial glands. General miliary tuberculosis was encountered only in exceptional cases.

11. The pneumonias of young children were very often (one-fifth of all cases) complicated with pleuritis, fibrinous forms being observed more often with primary lobar pneumonias, and purulent with lobular broncho-pneumonias. Pleuro-pneumonias were oftener double, and, when unilateral, usually left-sided.

A CASE OF ANÆMIA INFANTUM PSEUDO-LEUKÆMICA.

FISCHL (*Prager medicinische Wochenschrift*, 1894, No. 1) reports a case under this title which offers certain very interesting peculiarities. The patient was a child of little more than a year old, badly nourished, pale, and presenting all the symptoms of grave rhachitis. The spleen was markedly hypertrophied, descending into the pelvis and extending beyond the median line. The liver was also hypertrophied, reaching one and a half fingers' breadth below the border of the ribs. The lymph-glands were enlarged considerably, forming distinct chains. Alternating diarrhœa and constipation were present. The affection had begun about five months before, developing after the first signs of rhachitis were evident, a condition which had only appeared after

the child had been weaned from the maternal breast. When the case was first seen by the author there was already hypertrophy of the spleen and liver, while among the gland groups the inguinal were the only ones visibly affected.

Examination of the blood then showed a leucocytosis of moderate intensity. A complete examination of the blood, made a few days before the report, gave the number of red corpuscles 2,300,000; white corpuscles 250,000, or a proportion of 1 to 9; hæmoglobin 40 per cent. (Fischl). There was consequently considerable leucocytosis. Histologically there was a predominance of monochromatophilic leucocytes with large nuclei, a poikilocytosis, and a great number of erythroblasts of normal dimensions and with nuclei in a state of division.

Passing in review the writings of von Jaksch and other German writers, as well as those of Hayem and Luzet of the French school, the author shows that the case under discussion may be considered equally well as an example of pseudo-leukæmia or as a true leukæmia. The hypertrophy of the liver, the generalized lymphadenitis, proceeding by recurring attacks, and the rapid course are in favor of true leukæmia; while the histological elements of the blood, according to certain writers, would be justly characteristic of that affection. On the other hand, the enormous swelling of the spleen compared with the moderate hypertrophy of the liver and the particular form of adenopathy would suggest a pseudo-leukæmia, a view that would be confirmed by the richness of the blood in erythroblasts and its poverty in eosinophilic elements. The question could probably only be solved at the autopsy, which would determine the presence or absence of the characteristic lesions of the organs and bone-marrow associated with true leukæmia. The author thinks, finally, that the anæmia infantum pseudo-leukæmica of v. Jaksch is not an autonomous disease but a result of a number of debilitating troubles.

This opinion was supported in the discussion by Epstein, who cited a number of cases in which this pseudo-leukæmia was secondary to other morbid states. He has seen it develop in nurslings following chronic septicæmias, attended with the formation of a single or of multiple abscesses, sometimes six to eight months after the primary accident; and in these cases, if the history had not been known, the diagnosis of primary anæmia pseudo-leukæmica would have been made. In other cases this anæmia is observed following a latent tuberculosis of the bronchial and mediastinal glands; after infections of intestinal origin; as a result of hereditary syphilis, the manifestations of which had disappeared after a few weeks; after grave gastro-intestinal troubles, and after rhachitis. Finally, Epstein has observed a series of cases in which malaria could be incriminated as the exciting factor.

A CASE OF MYXŒDEMA IN A CHILD.

M. IMERWOL, of Jassy (Transactions of the Eleventh International Medical Congress, Section of Pediatrics, *La Semaine Médicale*, April 18, 1894, p. 187), reported the case of child four years of age who presented all the clinical symptoms of myxœdema with complete idiocy. Injections of thyroid extract continued for twenty days caused a notable amelioration, as evidenced by the diminution of tumefaction of the skin; the psychic state also improved.

Unfortunately, the child was attacked with erysipelas and died. At the autopsy there was found complete absence of the thyroid. The brain was well developed and weighed 950 grammes. Histological examination of the skin showed that the infiltrating material was fatty, not mucous, the condition being described by the author as a veritable lipomatosis of the skin.

This case adds another to the list of autopsies on such cases recorded by Sick and Nauwerke, Bourneville and Bricon, Bourneville and Pilliet, and Marfan and Guinon (see this department, April, 1894), and emphasizes the plea made by the last-named observers that the erroneous term myxœdema should be discarded in favor of Charcot's—*cachexie pachydermique*.

THE STUMP OF THE UMBILICAL CORD IN THE NEWBORN.

DOKTOR (*Archiv. f. Gynäk.*, 1894, Part 3) mentions three factors which render the stump of the cord an easy avenue for infection. First, the wound involves not only the skin, subcutaneous tissue, and muscular layers of the abdominal parietes, but also includes the peritoneum; secondly, three large vessels are exposed in the stump; and, finally, a quantity of dead tissue must remain in the wound for some considerable time. The author compares the Whartonian jelly to the gelatin employed for bacteriological cultures. When the skin, as sometimes happens, extends some distance along the cord in the form of a tongue-like process, healing is slow. Extension of the attachment of the amnion beyond its normal limit usually results in decided weakening of the umbilical region. The so-called fungus of the umbilicus results from the deeper tissues invading the Whartonian groove and growing upward into the centre of the cord, remaining as a conical projection when the funis separates. Among 462 newborn children observed, an elevation of temperature was noted in 107, and in 42 of these the author was able to trace an infection from the umbilical wound. He states that the original dressing of the cord should not be disturbed, and thinks it better to omit the daily bath for a short time rather than disturb this dressing.

THE OBLITERATION OF THE DUCTUS ARTERIOSUS AT BIRTH.

STRASSMANN, at a meeting of the Berliner medicinische Gesellschaft, April 11th (*La Semaine Médicale*, April 18, 1894, p. 185), questioned the usual explanation of the mechanism of the obliteration of the ductus arteriosus. He states that thrombosis of this canal is very rarely found, and that in all cases in which it is found it is pathological; in the second place, it has never been demonstrated that this canal can contract or bend at the moment of the first respiration to the point of obliterating its lumen.

The author suggests the following explanation as the most rational to his mind: At the moment when respiration is established blood-pressure diminishes in the right heart and pulmonary artery, while it is increased in the left heart and aorta. As a result of this the aortic orifice of the ductus arteriosus receives less blood and is submitted to a mechanical pressure which determines its obliteration. It is known that obliteration does not occur when the respiration is not sufficiently established and the lung remains uninflated. Moreover, the same result obtains when, following a premature respiration, the arterial canal is too distended to permit of its obliteration,

and a condition of asphyxia is induced calling for bloodletting. Obliteration also does not occur when the relations of blood-pressure in the great vessels are transposed, as is observed in cases of malformation of the heart or stenosis of the pulmonary artery or aorta.

All these considerations prove that the aortic orifice of the ductus arteriosus closes mechanically, a fact which permits us to understand its reopening in certain determinate conditions.

To demonstrate his theory the author injected the vessels of a number of fœtuses with a coagulable liquid. While with the pressure of 100 mm. of mercury the arterial canal could not be injected by way of the aorta, this could be done with great ease, even eight days after birth, by injecting by way of the pulmonary artery. To inject by way of the aorta it was necessary that the fœtus should not be completely developed (not later than the beginning of the eighth month with the human fœtus), or that the arterial duct should have a certain width from premature respiration, or that the pressure in the aorta be very high.

A CASE OF MELÆNA NEONATORUM.

SCHÜTZE (*Centralblatt f. Gynäkol.*, 1894, No. 9) reports a case in a strong male infant born at term of a mother sixteen years of age. The cord was twisted once around the neck but not tightly enough to cause an asphyxia. The left parietal bone was imperfectly ossified, one part crackling like parchment when pressed. Forty-four hours after birth the child passed blood freely from the bowel, but the hemorrhage was checked by cold gruel enemata containing a few minims of perchloride of iron. Twenty-four hours later the child was very anæmic and cold, though no more blood had been passed, and the abdomen was not swollen. A few hours later blood was again passed at stool and was also vomited. Collapse ended in death an hour later. The umbilicus and its vessels were found healthy, but the mouth was full of dark tea-colored blood, as were also the pharynx, œsophagus, trachea, bronchi and larger tubes, the stomach, the lower part of the ileum, and the large intestine. No ulceration of the intestinal mucous membrane could be detected; the duodenum, jejunum, and upper part of the ileum were empty. The lungs were very emphysematous. There were ecchymoses of the dura mater.

PERIODS OF ISOLATION FOR CONTAGIOUS DISEASES OF CHILDHOOD.

IN the course of a report upon this subject, OLLIVIER (*Gazette Médicale de Strasbourg*, 1894, No. 2, p. 17) makes the following rules:

For scarlatina, variola, varioloid, and diphtheria, the period of isolation, before the child is allowed to return to school, should be forty days, counting from the first day of invasion.

For measles and varicella sixteen days will be sufficient.

For pertussis isolation should be prolonged to three weeks after complete cessation of the characteristic kinks.

For mumps, ten days after the disappearance of the local symptoms.

Nasal, buccal, and pharyngeal irrigations with antiseptic solutions should be employed, and soap bath and rubbing of the entire surface and scalp should be a necessary preparation before returning to school.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

JOHN SLADE ELY, M.D.,

PROFESSOR OF PATHOLOGY IN THE WOMAN'S MEDICAL COLLEGE OF THE NEW YORK
INFIRMARY; ASSISTANT IN PATHOLOGY IN THE COLLEGE OF PHYSICIANS
AND SURGEONS; PATHOLOGIST TO BELLEVUE HOSPITAL.

FEVER.

WITH the development of our knowledge of the acute infectious diseases, has arisen the theory that the fever occurring as a part of their clinical picture is the result of the action on the body of certain diffusible products of the bacteria which are their cause. With a view to adding definiteness to this theory, CENTANNI has undertaken an exhaustive study of the fever of the infectious diseases, his investigation being directed to the determination of the following points: 1. What are the agents which cause the fever in these diseases? 2. What is the mechanism by which they act? 3. What therapeutic deductions are possible from the facts developed? The work is not yet completed, but a number of facts bearing upon the first question have been discovered, and form the basis of a preliminary paper upon the Fever-producing Poison of the Bacteria.—*Deutsch. med. Woch.*, 1894, Nos. 7 and 8.

The investigation extended to seventeen pathogenic species, seven non-pathogenic, and to cultures made from air, water, putrefying animal matter, and urine, without any attempt to separate or identify the several species. From cultures of these germs, *devoid of peptone*, Centanni obtained, by repeated precipitation with alcohol and dialysis, a substance whose chemical properties are quite distinct from those of the bacterial poisons heretofore described (ptomaines, enzymes, toxalbumins), and which, when injected into animals, causes fever, prostration, loss of flesh, and finally death, if continued. This substance, which Centanni believed to be the same in all species of bacteria, is designated by him "pyrotoxina bacterica." It is believed to be in some way derived from the protoplasm of the germs, or to be elaborated by it, and its production is thought to be a quality of all bacteria. He is led to believe that the fever accompanying the acute infectious diseases in man is due to an intoxication of the system by this poison, and explains the irregular course of the fever in the different diseases by the theory that the poison depends for its elaboration upon variable conditions, and that it is these conditions which are different in the various diseases and at different times in the same disease, not the poison.

PYOGENIC MICROCOCCI IN THE BLOOD IN PHTHISIS.

THE large number of bacteria, other than the tubercle bacilli, usually present in the sputum of phthisical patients in whom breaking-down of the lung tissue is associated with more or less fever, and the fact that these bacteria have been shown by cultures to belong in most cases to the group called "pyogenic," have suggested that much of the consolidation of the lung, and, per-

haps, the rise of temperature also, might be dependent upon a "mixed infection" with these pyogenic bacteria. Believing that if the fever were due to the action of these germs it must be regarded in the light of septicæmia, in which case the bacteria producing it would be found in the blood during the febrile exacerbations, JAKOWSKI (*Centralb. f. Bakt.*, Dec. 9, 1893, 262) has examined the blood of nine patients suffering from advanced phthisis, with the result of finding the pyogenic bacteria in seven. *Staphylococcus pyogenes aureus* was present in five of the cases; *streptococcus pyogenes* in three, these two germs being found associated in one case. It is of interest that in one case, seen early in the disease, the examination of the blood was negative until signs of cavity developed, when both *staphylococcus* and *streptococcus* were found.

CHEESY PNEUMONIA.

As bearing upon the same question of mixed infection in phthisis we may summarize the conclusions reached by FRAENKEL and TROJE (*Zeitschr. f. klin. Med.*, xxiv., 1894), after an exhaustive study of cheesy pneumonia, that condition above all others in which the combined action of other germs with the tubercle bacillus might be expected. The paper is based upon thirteen carefully studied cases, the first part being devoted to the clinical histories; the second to the pathological anatomy as developed at the autopsies.

The clinical features of the cases in question may be summarized somewhat as follows: A previously healthy individual, often quite robust and without hereditary predisposition, is rather suddenly taken sick with fever, cough, and prostration. When seen by the physician the signs of one-sided consolidation of the lung, usually at the base behind, are present. The sputum may resemble that of acute lobar pneumonia, and in this early stage the differential diagnosis of the tubercular from the latter affection may be impossible. Usually, however, the course of the disease is more protracted than that of lobar pneumonia, the fever continuing after the usual time of crisis in that disease. Paleness of the face, sweating and progressive emaciation; continuance of cough, with often bright-green expectoration, in which careful search reveals tubercle bacilli; the presence of the "diazo reaction" in the urine; and the absence of a degree of dyspnoea and cyanosis, which would be expected with the amount of consolidation and prostration present, serve in the later stages to differentiate this disease from the more common lobar pneumonia. In from two to twelve weeks the patient dies of exhaustion.

At the autopsy one or more lobes of the lung are found consolidated, usually of a grayish color, and somewhat mottled appearance. In about one-half the cases one or more small cavities are present. The mottling of the consolidated lung is found to depend upon the presence of irregularly-shaped larger or smaller areas of cheesy material around which are more translucent areas spoken of as gelatinous in appearance. These are irregularly distributed and merge into one another, producing considerable variety of appearance. Tubercular bronchitis is frequently present.

Microscopical examination shows but little change in the tissue of the lung in comparison with the great amount of exudate which has accumulated in the air vesicles. This is essentially composed of exfoliated and

swollen alveolar epithelium, though fibrin and the organized constituents of the blood are also present. The cheesy areas show that coagulation necrosis has very quickly destroyed the exudate. Miliary tubercles are often found scattered about in the portions of lung less intensely diseased, but they never form an important feature of the lesion, which is essentially a pneumonic exudative process. Yet bacterial examination of the sputum during life and of scrapings from various portions of the consolidated lung after death revealed to Fränkel and Troje only tubercle bacilli in all but one of the thirteen cases, and the importance of this fact as militating against the theory of a necessarily mixed infection in the so-called pneumonic variety of phthisis can hardly be overestimated. There could be no doubt that in twelve of the cases studied an exudative pneumonic process had been caused by the tubercle bacillus.

Animal experiments demonstrated that similar lesions to those observed in man could readily be produced in rabbits by intra-tracheal injection of pure culture of tubercle bacillus, and subsequent bacterial examination of the lesions showed that here also no other germ had been at work.

The conclusion is then inevitable that, though other bacteria may at times be associated with the tubercle bacillus in the lesions of phthisis they are in no way an essential etiological factor in the process, and the differences in lesion between the exudative form of tuberculosis of the lung and the form in which tubercles made up more or less of new reticular connective tissue form a predominant element, are believed by Fränkel and Troje to depend upon a different mode of infection in the two cases, the bacilli being in the air vesicles in the former case, to which they have gained access by inhalation, while in the latter they are in the walls of the vesicles, whither they have been carried by the blood or lymph.

VIABILITY OF THE PYOGENIC MICROCOCCI.

A SOMEWHAT remarkable case of osteomyelitis is reported by SCHNITZLER (*Centralb. f. Bakt.*, xv., 1894, 270), which illustrates the long viability of the pyogenic cocci under certain circumstances. The patient, a man forty-two years of age, had suffered from an acute osteomyelitis of the right tibia when a boy of seven. There was then discharge of pus and bone from the tibia with resultant sinus formation. The sinus healed in about six months, and he remained well during *thirty-five* years. In August, 1892, the right shin began to be painful, and he had occasional irregular fever. After four months of these symptoms he presented himself for treatment at the hospital. Operation showed thickening of the tibia in the site of the old sinus, but no fistulous opening could be found, and healing of the old process of thirty-five years before appeared to have been complete until, on chiseling into the bone, an old cavity about the size of a walnut was discovered. This cavity contained a few fragments of bone and a small amount of pus. It was surrounded by a dense layer of bone and was lined with granulation tissue. The contained pus and portions of the granulation tissue removed with the sharp spoon were examined bacteriologically, with the result of obtaining pure cultures of the staphylococcus pyogenes aureus, which inoculations into rabbits proved to be virulent.

Because of the dense tissue surrounding the abscess in the bone, and because no fresh source of infection could be discovered, Schnitzler feels compelled to believe that germs pocketed in the bone during the primary infectious process had transmitted their virulence through the many generations which must have existed during the thirty-five years which had elapsed between the primary disease and the subacute relapse.

In support of this view reference is made to similar cases reported by Krause, Ressemann, and Müller, in which abscesses of bone developed in the site of suppurative processes which had "healed" thirty, thirty, and four years before respectively.

TUBERCULOSIS OF THE PLACENTA.

At the meeting of January 10, 1894, of the Berliner medicinische Gesellschaft, LEHMANN (*Deutsche med. Wochenschr.*, 1894, No. 4, p. 87) demonstrated a placenta in which there were areas of tubercular inflammation containing tubercle bacilli in abundance. The placenta came from a woman who was suffering from chronic phthisis, and whose child had died ten days after birth, but without lesions of tuberculosis. The presence of the lesions and of the bacilli in the placenta clearly shows a mode of direct transmission of the infectious material from mother to foetus, which is probably more frequent than has been supposed. (*Cf. THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, March, 1893, p. 358.)

MUSCULAR RHEUMATISM.

THE work of Sahli, upon articular rheumatism, has suggested to LEUBE (*Deutsche med. Wochenschr.*, 1894, i., No. 1) a microbic etiology for muscular rheumatism. Three cases are cited in which typical muscular rheumatism was complicated by endocarditis, and this, with the epidemic occurrence of the disease at times, its accompanying fever, and its occasional development into typical articular rheumatism—as occurred in the first of Leube's cases—lead him to regard muscular rheumatism also as an infectious disease, and as due in all probability to the same cause as the articular variety.

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All communications should be addressed to

DR. EDWARD P. DAVIS, 250 South 21st Street, Philadelphia, U. S. A.

Or

DR. HECTOR MACKENZIE, 59 Welbeck St., Cavendish Sq., W., London, Eng.

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